EN

Gas fired condensing boiler

C 230 ECO

Installation and Service Manual

300015171-001-E

De Dietrich

Declaration of conformity CE

The appliance complies with the standard model described in declaration of compliance CE. It is manufactured and distributed pursuant to the requirements of european directives. The original of the declaration of compliance is available from the manufacturer.

DÉCLARATION DE CONFORMITÉ CE
EG - VERKLARING VAN OVEREENSTEMMING
EC - DECLARATION OF CONFORMITY
EG - KONFORMITÄTSERKLÄRUNG

Fabricant/Manufacturer/Hersteller/Fabrikant	: De Dietrich Thermique
Adresse/Addres/Adress	: 57 rue de la gare
Ville, pays Stad,Land/City,Country/Land,Ort	: F-67580 MERTZWILLER
- déclare ici que les produit(s) suivant(s) - verklaart hiermede dat de toestel(len) - this is to declare that the following product(s) - erklärt hiermit das die Produk(te)	: C 230- … Eco
produit(s) par	: De Dietrich Thermique : 57, rue de la Gare, F-67580 Mertzwiller

répond/répondent aux directives CEE suivantes:
voldoet/voldoen aan de bepalingen van de onderstaande EEG-richtlijnen:
is/are in conformity with the following EEC-directives:
den Bestimmungen der nachfolgenden EG-Richtlinien entspricht/entsprechen:

CEE-Directive: EEG-Richtlijn: EEC-Directive: EG-Richtlinie:	90/396/CEE 90/396/EEG 90/396/EEC 90/396/EWG	normes appliquées, toegepaste normen: tested and examined to the following norms: verwendete Normen: EN 656 A1(2006), EN 15417(2006), prEN 15420(2006)
	92/42/CEE 92/42/EEG 92/42/EEC 92/42/EWG	
	73/23/CEE 73/23/EEG 73/23/EEC 73/23/EWG	DIN EN 50165(2001) EN 50165 (1997+A1:2001) DIN EN 60335-1(2003), EN 60335-1(2002)
	89/336/CEE 89/336/EEG 89/336/EEC 89/336/EWG	EN 55014-1(2000+A1:2001+A2:2002) EN 55014-2(1997+A1:2001) EN 61000-3-2(2000+A2:2005), EN 61000-3-3(1995+A1:2001)
	97/23/CEE 97/23/EEG 97/23/EEC 97/23/EWG	(art.3 section 3) (art. 3, lid 3) (article 3, sub 3) (Art. 3, Absatz 3)

CE
07

Mertzwiller, le 19 mars 2009

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Benoit MADDENS
Directeur d'activité Chaudières au sol

C002764-A

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1 Introduction

1.1 Symbols and abbreviations

Caution danger
Risk of injury and damage to equipment. Attention must be paid to the warnings on safety of persons and equipment.

Specific information
Information must be kept in mind to maintain comfort.

Reference
Refer to another manual or other pages in this instruction manual.

DHW: Domestic hot water

PCU: Primary Control Unit (Operating management electronics)

SU: Safety Unit (Safety electronics)

PSU: Parameter Storage Unit (Boiler parameter storage)

CCE: Leak proofing system

1.2 General

Thank you for choosing this quality product. We are convinced that it will meet all of your expectations.

In the interest of customers, De Dietrich Thermique SAS are continuously endeavouring to make improvements in product quality. All the specifications stated in this document are therefore subject to change without notice.

1.2.1 User's liability

To ensure the optimum operation of your appliance, we strongly recommend that you abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on qualified professionals to :
  - Carry out installation in compliance with the prevailing legislation and standards,
  - Perform the initial start up
  - carry out work on the appliance and the installation
- Keep these instructions in a safe place close to the appliance.
- Get your fitter to explain your installation to you.

1.2.2 Manufacturer's liability

- The liability of De Dietrich Thermique SAS as the manufacturer may not be invoked in the following cases:
  - Incorrect use of the appliance,
  - Faulty or insufficient maintenance of the appliance,
  - Incorrect installation of the appliance.

1.3 Homologations

1.3.1 Certifications

■ In general

CE identification no: **CE-0085BS0132**

■ In particular for France

Performance class III boiler according to ATG B 84 recommendations.

■ In particular for Switzerland

The boilers comply with the following standards:

- Federal legislation on Air Protection (OPAIR)
- Directives of the Société Suisse de l'Industrie des Gaz et des Eaux SSIGE
- Directives of local and cantonal bodies
- CFST directives, liquefied gases, part 2
- Directives of the Association des Etablissements Cantonaux d'Assurance Incendie AEAI

Boilers are tested under the LRV-92 standard.

■ In particular for Germany

C 230 ECO boilers comply with Regulation 1. BImSchV.

■ In particular for Belgium

The boilers comply with the specifications of the HR+ quality label.

The boilers comply with the requirements and standards defined in the Royal Order of 8 January 2004.

Déclaration de conformité à l'Arrêté royal du 08/01/2004
Konformitätserklärung - Königlicher Erlass vom 08. Januar 2004
Conformiteitsverklaring - Koninklijk Besluit van 8 januari 2004

Fabricant : De Dietrich Thermique S.A.S.
Hersteller: 57 rue de la gare
Fabrikant: F-67580 MERTZWILLER
Tél : +33 3 88 80 27 00
Fax : +33 3 88 80 27 99

certifie par la présente que le(s) produit(s) suivant(s) : C230-… Eco
erklärt hiermit, dass das(die) folgende(n) Produkt(e):
verklaart hierbij dat het(de) volgende product(en):

est conforme aux exigences de l'Arrêté royal du 08/01/2004 et aux exigences des normes suivantes :
die Anforderungen des Königlichen Erlasses vom 08. Januar 2004 sowie die Anforderungen der folgenden Normen erfüllt:
beantwoord(en) aan de eisen van het Koninklijk Besluit van 08/01/2004 en aan de eisen van de volgende normen:

EN 656 $A1_{(2006)}$; EN $15417_{(2006)}$; prEN $15420_{(2006)}$

Les valeurs NOx et CO ci-après, mesurées sur chaque chaudière mentionnée :
Die nachstehenden NOx- und CO-Werte, gemessen an jedem der genannten Heizkessel:
De volgende NOx- en CO-waarden, gemeten op iedere vermelde verwarmingsketel:

- C230-85 Eco NOx : 62 mg/kWh ; CO : 19 mg/kWh
- C230-130 Eco NOx : 54 mg/kWh ; CO : 15 mg/kWh
- C230-170 Eco NOx : 49 mg/kWh ; CO : 16 mg/kWh
- C230-210 Eco NOx : 58 mg/kWh ; CO : 19 mg/kWh

ont été certifiées par l'organisme certificateur suivant :
wurden von der folgenden Zertifizierungseinrichtung zertifiziert:
zijn door de volgende certificeringsinstantie gecertificeerd:

TÜV Rheinland Am Grauen Stein D-51105 KÖLN

Les appareils mentionnés ci-dessus sont de classe NOx : 5
Die oben genannten Geräte gehören der folgenden NOx-Klasse an: 5
De hierboven vermelde apparaten zijn van de klasse NOx: 5

La documentation technique relative à la gamme précitée est conservée par le responsable des essais.
Die technische Dokumentation zur vorgenannten Produktreihe wird vom Zuständigen für die Prüfungen aufbewahrt.
De technische documentatie met betrekking tot het vernoemde assortiment wordt bewaard door de voor de tests verantwoordelijke persoon.

MERTZWILLER, le 22 octobre 2009

Benoit MADDENS
Directeur de l'Activité Chaudières au sol
Direktor der bodenstehenden Kessel
Director of gas floor standing boilers

1.3.2 Gas category

■ In general

User country	Gas category	Gas type	Connection pressure (mbar)
FR	II_{2ESi3P}	G20	20
		G25	25
		G31	37
DE	II_{2ELL3P}	G20	20
		G25	20
		G31	50
PL	II_{2ELw3P}	G20	20
		G27	20
		G31	37
BE	$I_{2E(R)B}$	G20	20
	I_{3P}	G31	37
NL	II_{2L3P}	G25	25
		G31	30/50
	I_{2H}	G20	25
HU	II_{2HS3P}	G20	25
		G25.1	25
		G31	50
LU	II_{2E3P}	G20	20
		G31	50
UA, LV	I_{2H}	G20	20
AT, BG	II_{2H3P}	G20	20
		G31	50
DK, EE, FI, IS, NO, RO, SE	II_{2H3P}	G20	20
		G31	30
IE, LT, SI, ES, GB, IT, CH, TR, GR, PT	II_{2H3P}	G20	20
		G31	37
CZ, CY, BY, HR, RU, SK	II_{2H3P}	G20	20
		G31	37
		G31	50
MT	I_{3P}	G31	37

C 230 ECO boilers are delivered preset for operation on natural gases of H/E groups.

For operation on another type of gas, see chapter "Changing gas".

2 Safety instructions and recommendations

2.1 Safety instructions

2.1.1 Fire hazard

Do not stock products of an inflammable nature close to the appliance.

If you smell gas, do not use a naked flame, do not smoke, do not operate electrical contacts or switches (doorbell, lights, motor, lift, etc.).

1.Cut the gas supply
2.Open the windows
3.Extinguish all flames
4.Evacuate the premises
5.Contact a qualified professional
6.Inform the gas supplier

2.1.2 Risk of intoxication

Do not obstruct the air inlets in the room (even partially).

If you smell flue gases

1. Switch the appliance off
2. Open the windows
3. Evacuate the premises
4. Contact a qualified professional

2.1.3 Risk of being burnt

Avoid direct contact with the flame viewport.

Depending on the settings of the appliance:

- The temperature of the flue gas conduits may exceed 60°C
- The temperature of the radiators may reach 95°C
- The temperature of the domestic hot water may reach 65°C

2.1.4 Risk of damage

Do not stock chloride or fluoride compounds close to the appliance.

Install the appliance in frost-free premises.

Do not neglect to service the appliance: Contact a qualified professional or take out a maintenance contract for the annual servicing of the appliance.

2.2 Recommendations

Only qualified professionals are authorised to work on the appliance and the instalation.

Before any work, switch off the mains supply to the appliance.

Check regularly that the installation contains water and is pressurised.

Keep the appliance accessible at all times.

Avoid draining the installation.

The appliance should be on Summer or Antrifreeze mode rather than switched off to guarantee the following functions:

- Antifreeze protection
- Protection against corrosion on domestic hot water tanks fitted with a titanium anode

3 Technical description

3.1 General description

The C 230 ECO boiler is a gas fired condensing boiler.

The cast aluminium-silicium heat exchanger is designed for the recuperation of the sensible and latent heat in combusted gases.

This watertight combustion circuit boiler can be used in a forced flue version. Installation with air intake from the premises is also possible.

The burner and the combustive air inlet fan are very quiet.

Gas and combustive air is supplied via the upper part of the boiler. Underneath the boiler is a condensates collector in composite material and a siphon to evacuate condensates, located on the side.

The flow temperature can be set between 20°C and 90°C (Factory setting: 80 °C).

The C 230 ECO boiler is fitted with a low water safety system based on divergence and rise in temperature readings.

Output may modulate between 18%(1) and 100% depending on the heating requirement. The boilers can be fitted with a **DIEMATIC-m3**(2) electronic control panel which is factory set to include priority domestic hot water production and a control system which operates according to the outside temperature.

The DIEMATIC-m3 control panel with built-in regulator controls automatic operation of heating as a function of:

- The outside temperature.
- The ambient temperature when the remote control (as an option) is connected.

The K3 control panel is fitted only in association with a boiler fitted with a DIEMATIC-m3 control panel as part of a cascade installation.

DHW regulation and programming is handled by the DIEMATIC-m3 control panel on the master boiler.

The regulator also provides antifreeze protection for the installation and the environment, if the home is empty, for a period that may be programmed one year in advance and lasting for up to 99 days.

(1) Depending on the boiler model

(2) or K3 control panel for the secondary boiler(s)

3.2 Technical characteristics

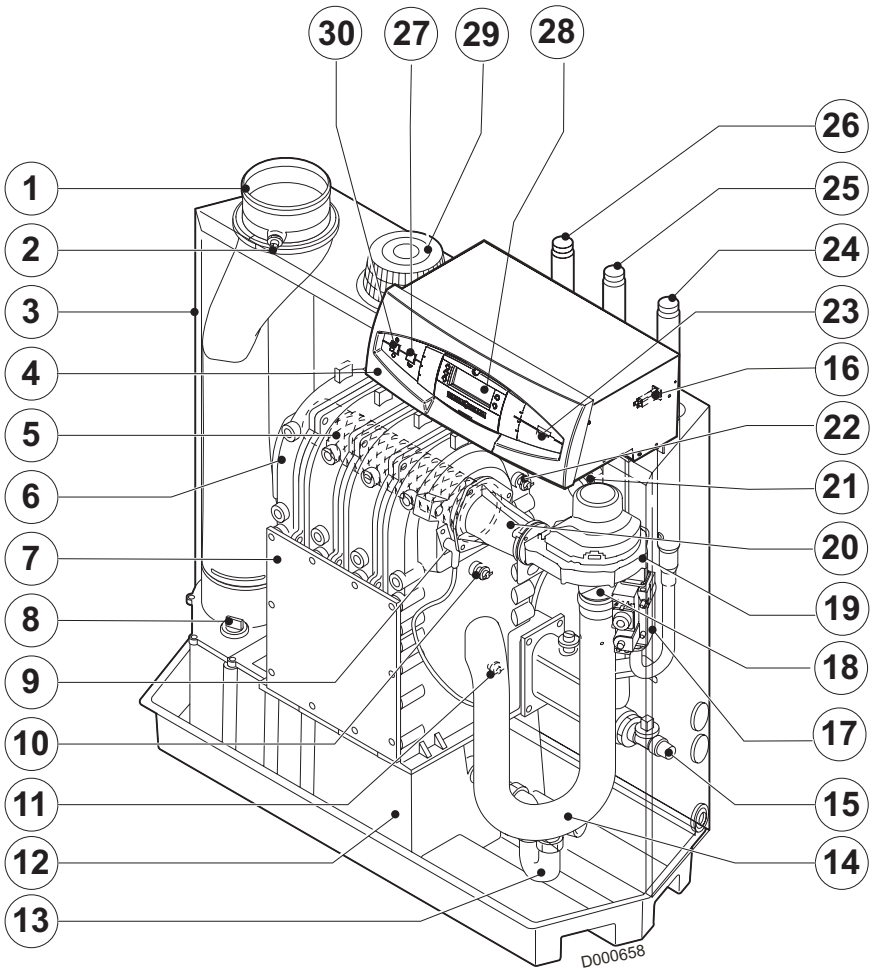
C 230-... ECO		Unit	85	130	170	210
General						
Number of sections			3	4	5	6
Burner operation			**Modulating**			
Useful output (80/60°C) PN (G20)	minimum	kW	16	22	29	39
	maximum	kW	87	113(1)/120	166	200
Useful output (50/30°C) PN (G20)	minimum	kW	18	24	33	44
	maximum	kW	93	121(1)/129	179	217
Burner output (PCI) (G20) (Power input)	minimum	kW	17	23	31	41
	maximum	kW	89	**115**(1)/123	170	205
Combustion gas and by-products						
Gas supply pressure G20		mbar	17 - 30			
Gas flow rate G20 (15 °C - 1013 mbar)	minimum	m^3/h	1.8	2.4	3.3	4.3
	maximum	m^3/h	9.4	12.2(1)/13	18	21.7
Gas flow rate G25 (15 °C - 1013 mbar)	minimum	m^3/h	2.1	2.8	3.8	5.0
	maximum	m^3/h	11	14.4	20.9	25.2
Gas flow rate G27 (15 °C - 1013 mbar)	minimum	m^3/h	2.2	3.0	4.0	-
	maximum	m^3/h	11.5	15.9	22.0	-
Gas flow rate G31	minimum	Kg/h	1.94	1.94	3.42	3.19
	maximum	Kg/h	6.91	9.56	13.21	15.93
CO_2 (G20-G25) Qmin.-Qmax (Open air box)		%	9.3-8.8	9.3-8.8	9.3-8.8	9.3-8.8
CO_2 (G20-G25) Qmin.-Qmax (Closed air box)		%	9.5-9.0	9.5-9.0	9.5-9.0	9.5-9.0
CO_2 (G27) Qmin.-Qmax (Open air box)		%	9.3-8.8	9.3-8.8	9.3-8.8	-
CO_2 (G27) Qmin.-Qmax (Closed air box)		%	9.5-9.0	9.5-9.0	9.5-9.0	-
CO_2 (G31) Qmin.-Qmax (Open air box)		%	10.5-9.8	10.5-9.8	10.5-9.8	10.5-9.8
CO_2 (G31) Qmin.-Qmax (Closed air box)		%	10.7-10.0	10.7-10.0	10.7-10.0	10.7-10.0
Average nitrogen oxide emission (NOx)		mg/kWh	62	54	49	58
Average CO emission		mg/kWh	19	15	16	19
Maximum pressure at the flue gas nozzle		Pa	130	130	130	130
Combusted gas flow (2)	minimum	Kg/h	27.2	36.7	49.5	65.5
	maximum	Kg/h	149.7	193.5(1)/ 206.9	286.0	344.9
Classification of type according to the discharge of combusted gases and air supply			B23, B23P, C13, C33, C43, C53, C63, C83			
Heating						
Safety temperature		°C	110			
Water setting range		°C	20 - 90			
Water pressure	minimum	bar	0,8			
	maximum	bar	6			
Water content		l	12	16	20	24
Water resistance at ΔT = 10K		mbar	660	540	680	720
Water resistance at ΔT = 20K		mbar	165	135	170	180
Electricity characteristics						
Power supply voltage		V/Hz	230 / 50			

C 230-... ECO		Unit	85	130	170	210
Power consumption	minimum	W	34	36	56	59
	maximum	W	125	193	206	317
Insulation class		IP	21			
Miscellaneous						
Weight without water		kg	130	150	170	200
Acoustic level at 1 meter		dBA	≤ 57			≤ 63

(1) For Italy - **Limiting input to 115 kW : See chapter: 5.4.5**

(2) G20 - Gas H

3.3 Main parts



1	Flue gas discharge duct
2	Measurement point O_2/CO_2 (Emplacement for fue gas sensor, Option)
3	Air enclosure
4	Control panel
5	Burner
6	Heat exchanger
7	Inspection hatch
8	Inspection cap / Cleaning
9	Ignition electrode / Ionization probe
10	Heating body sensor
11	Return sensor
12	Condensates collector
13	Siphon
14	Silencer
15	Filling and emptying tap
16	Circuit breaker
17	Multivalve gas unit
18	Venturi
19	Fan
20	Mixer pipe
21	Flue gas pressure switch
22	Output sensor

23	Connector for the programming tool
24	Gas connection
25	Return connection
26	Flow connection
27	Reset button
28	Display DIEMATIC-m3
29	Air inlet (Protective cage)
30	General ON ⏽ / OFF ◯ switch

3.4 Operating principle

A venturi is placed to the side of the fan inlet. The air and gas are mixed in here at a constant ratio.

The fan carries out a pre-sweep if there is a heat request. The fan sucks in the combustive air which will be optimally mixed with the gas in the venturi. The homogenous air/gas mixture is fed into the burner by the fan.

The mixture is ignited by the ignition/ionization combination electrode which also monitors the flame.

Boiler output is set according to the settings and temperatures of the water measured by the temperature sensors. When the combusted gas temperatures are lower than the dew point (approx. 55°C, the temperature as of which the steam in the combusted gases starts to condense), the steam in the combusted gases will condense in the lower part of the heat exchanger. The heat released during this condensation process (so-called latent or condensation heat) is also transferred to the central heating water. The condensed water is discharged via the siphon in the lower section of the heat exchanger. The combusted gases go into the condensates collector and are evacuated via the combusted gas evacuation duct.

To provide continuous heat, the boiler requires a minimum of 30% of the water flow rate at a ΔT of 20 K at nominal output, high stage. The boiler can be ocnstructed with a second return (accessory). This second return can provide additional efficiency when various temperatures are present in the installation.

The DIEMATIC-m3 control panel controls the room temperature in accordance to the outside temperature by action on the burner. Heating regulation is controlled by the influence of the regulator on the burner, the pumps and, if installed, the mixing valve(s).

Connecting a remote control with room sensor or an interactive remote control CDI 2 also enables self adaptivity of the gradient and the parallel offset of the heating curve.

The "installation anti-freeze" function is active regardless of the operating mode. It is triggered as soon as the outdoor temperature reaches the limiting value preset to +3°C (see paragraph: **Further information on various parameters**).

The domestic hot water is regulated by the regulator acting on the load pump through the DHW sensor. The DHW loop can be handled by the **S.AUX1:**, **S.AUX2:** or **S.AUX3:** outlet (Heating according to the time programme).

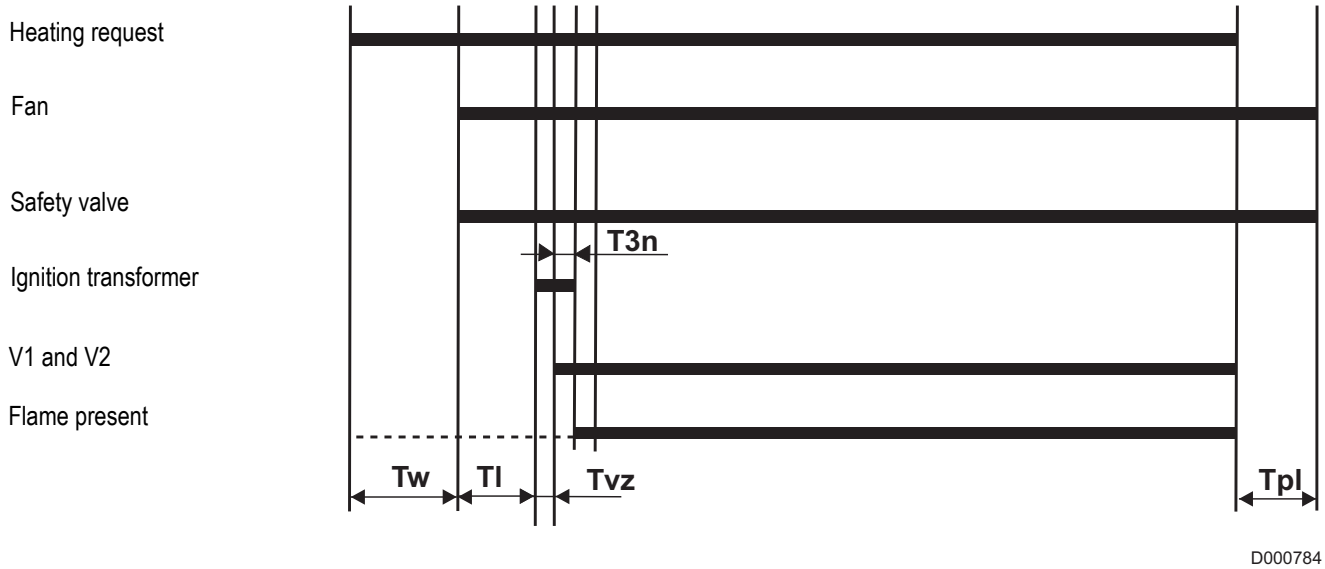
The DIEMATIC-m3 control panel includes the "anti-legionella" protection option

See: Control panel instructions (Installer parameters: **LEG PROTEC**).

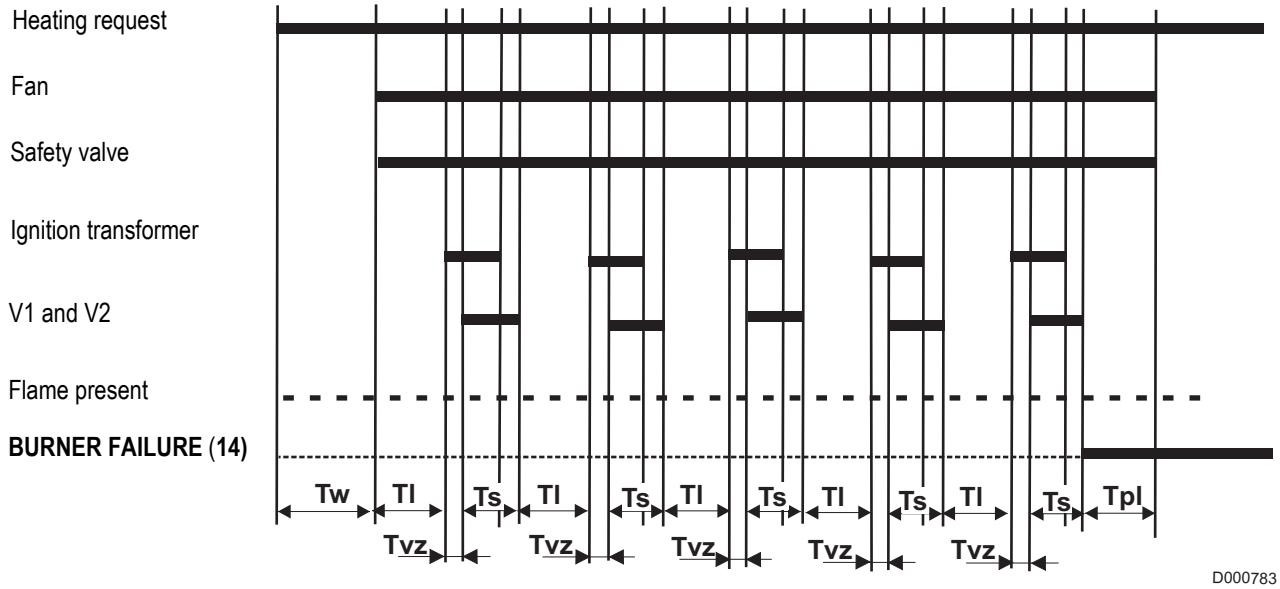
In a cascade installation, the K3 control panel is intended to be fitted to the secondary boilers.

3.4.1 Operating cycle

■ Normal operating cycle



■ Operating cycle on safety (start up without flame signal)

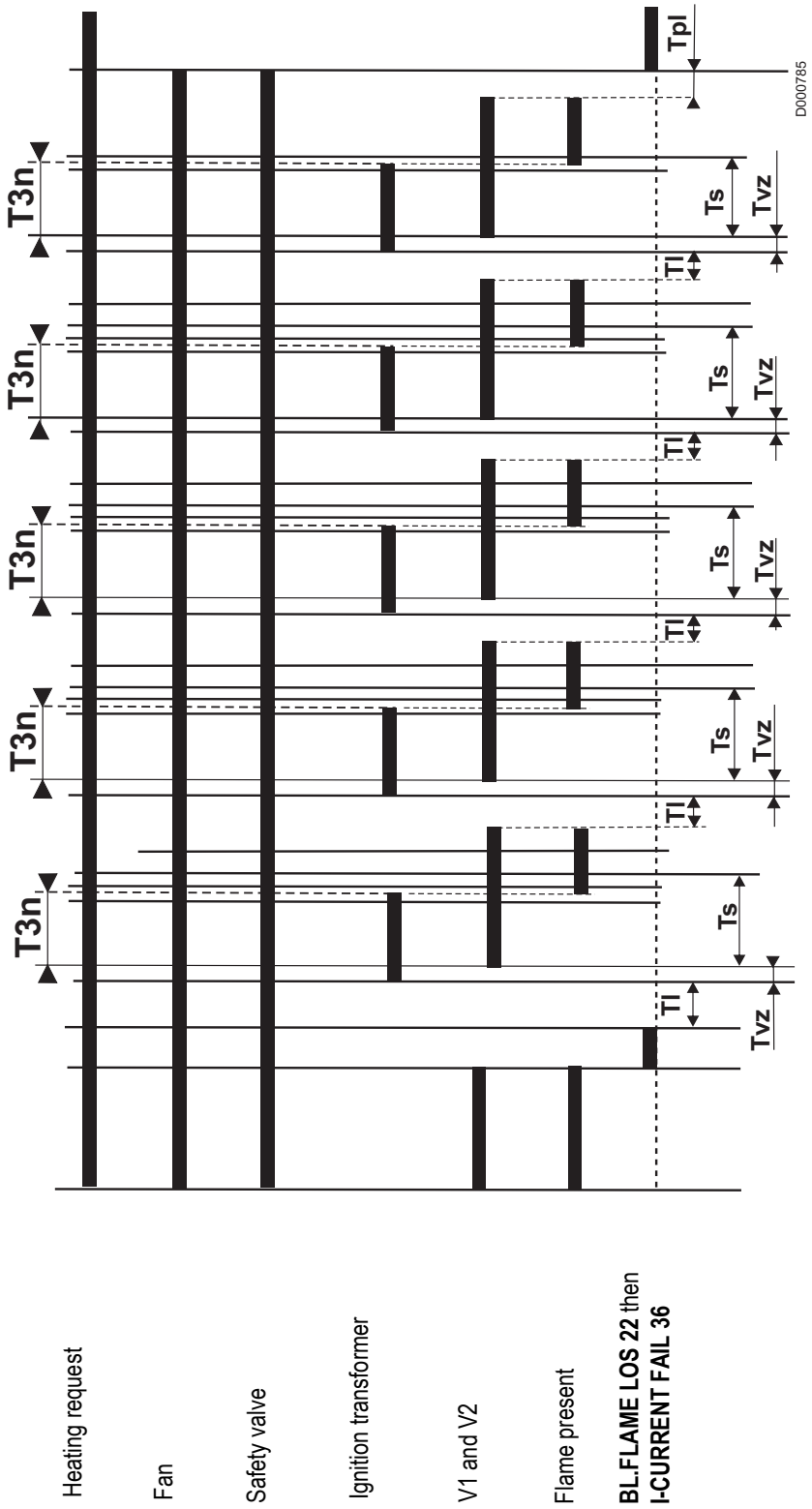


The safety control box makes 5 attempts to restart.
If restart fails, the safety control box switches to **BURNER FAILURE** (**14**).

Remarks:
Minimal ionization current: 1µA

Tl	Preventilation time (20 seconds)
Ts	Safety time (3.5 seconds)
Tpl	Post-ventilation time (20 seconds)
Tvz	Pre-ignition time
Tw	Waiting time (After a thermostatic request - about 20 seconds)
T3n	Ignition time

■ Loss of flame when running



Tl	Preventilation time (20 seconds)
Ts	Safety time (3.5 seconds)
Tpl	Post-ventilation time (20 seconds)
Tvz	Pre-ignition time
Tw	Waiting time (After a thermostatic request - about 20 seconds)
T3n	Ignition time

After the loss of signal, the safety control box switches to **BL.FLAME LOS** (**22**) for 10 seconds.
If the safety control box detects 5 flame losses, it goes into safety shutdown with the message **I-CURRENT FAIL** (**36**).
If the safety control box does not detect the flame loss 24 hours after the last loss, the meter is reset to zero.

3.4.2 Cyclical sealing control of the gas valve unit (170, 210 kW)

The sealing control system for the gas valve unit controls and checks the safety valves in the combined gas valve unit. The VPS system checks the tightness of the 2 valves during the pre-sweep, which extends the pre-sweep time somewhat. If a leak is detected, the boiler goes into safety shutdown (locking). The fault is signalled on the DIEMATIC-m3.

The connection of the sealing control system is made by a plug that can be found in the control panel. The presence of the sealing control system must be activated by the parameter "Kit CCE".

3.4.3 Minimum gas pressure switch

It is possible to connect a minimum gas pressure switch to the PSG connector. If there is a lack of gas pressure, the boiler is switched off with a message on the DIEMATIC-m3 if the set value is not reached.

The boiler restarts when the pressure is back to normal and after the waiting time of 10 minutes.

3.4.4 Max. safety temperature

The boiler goes into safety shutdown if the temperature is too high (110°C or less). After the breakdown has been repaired, the boiler can be unlocked by pressing the ☞ key.

3.4.5 Flow controller

The maximum difference in temperature between the outlet water and the return water, and the speed at which the outlet temperature increases, are restricted by the boiler's regulation.

This principle guarantees risk-free operation for the boiler even during transitory irrigation operations induced by changes of status on the installation's hydraulic units (closure 3-way valve, circuit shutdown, etc.). These settings lead to the burner being put on standby in order to protect the boiler from any damage.

We strongly recommend guaranteeing at all times a minimum flow corresponding to 30% of the nominal flow Qn (flow corresponding to a ΔT of 20K at Pn at 80/60°C). This enables optimum operation of the boiler's output range modulation device in order to get the best out of condensation (See table below).

Maximum water flow: Flow speeds in the heating body which are too high reduce the transfer of heat. Therefore, it is necessary to restrict the water flow to the value obtained using the following formula:

Qmaximum = Nominal useful output to 80/60 °C / 9,3 (See table below)

The C 230 ECO boiler is fitted with an electronic temperature regulator with flow and return temperature sensors.

Boiler type		Flow rate (m^3/h)
C230-85	Q minimum	1.0
	Qn	3.4
	Q maximum	8.6
C230-130	Q minimum	1.6
	Qn	5.2
	Q maximum	12.9
C230-170	Q minimum	2.1
	Qn	6.9
	Q maximum	17.2
C230-210	Q minimum	2.6
	Qn	8.6
	Q maximum	21.5

4 Installation

4.1 Regulations governing installation

4.1.1 In general

Installation and maintenance of the boiler must be carried out by a qualified professional in compliance with prevailing local and national regulations.

4.1.2 In particular for France

DTU 24.1 and DTU 65.4 define the technical terms and conditions with which the boiler room installation work must comply.

■ Residential buildings

Statutory terms and conditions of installation and maintenance:

The installation and maintenance of the appliance must be carried out by a qualified professional in compliance with the statutory texts of the codes of conduct in force, particularly:

- Order of 2 August 1977
Technical and safety rules applicable to combustible gas and liquefied hydrocarbon installations situated inside residential buildings and their annexes.

- NF P 45-204 standards
Gas installation, (formerly DTU 61-1, gas installations: April 1982, addendum no 1: July 1984).

- Local Sanitary Regulations

For appliances connected to the electricity network:

- NF C 15-100 standards Low voltage electrical installation - Rules..

■ Establishments open to the public

Statutory terms and conditions of installation:

The installation and maintenance of the appliance must be carried out in compliance with the statutory texts and rules of the codes of conduct in force, particularly:

- Safety regulations against fire and panic in establishments open to the public:

a. General regulations

For all appliances:

- Articles GZ - Installations operating on combustible gases and liquefied hydrocarbons.

Then, depending on use:

- Articles CH-Heating, ventilation, refrigeration, air conditioning and production of steam and domestic hot water.

b. Instructions specific to each type of establishment open to the public (hospitals, stores, etc.).

■ Certificate of compliance

For the application of article 25 of the modified decree dated 02/08/1977 and of article 1 of the modifed decree dated 05/02/1999, the installation engineer must be in possession of the certificates of compliance approved by the Ministries in charge of construction and gas safety:

- Different forms (forms 1, 2 or 3) for a new gas installation
- "Model 4" in particular after replacing a furnace with a new one

4.1.3 In particular for Germany

The gas condensing boiler (group II hot water tank) is constructed in compliance with TRD 702 and is used in heating installations in accordance with DIN EN 12828. The terms and conditions of use given in these directives must be respected. It is compliant with DIN 4702, part 6 in respect of the nominal calorific output and the technical heating specifications.

In addition to the instructions on construction and combustion equipment, also abide by the following standards, rules and directives when installing and commissiong gas condensing boilers:

- DIN 4705: calculation of chimney dimensions
- DIN EN 12828 (June 2003 edition): heating systems in buildings. Planning of hot water heating installations (up to a maximum operating temperature of 105°C and a maximum output of 1 MW)
- DIN 4753: drinking and industrial water heating installations
- DIN 1988: technical rules on drinking water installations (TRW)
- DVGW-TRGI: technical rules on gas installations, including complementary equipment
- Working paper DVGW G 260/I: technical rules on the nature of the gas

4.2 Package list

■ Boilers

- C 230-85 ECO: Package GV1
- C 230-130 ECO : Package GV2
- C 230-170 ECO : Package GV3
- C 230-210 ECO : Package GV4

■ Control panel

- Panel DIEMATIC-m3: Package GV6
- Panel K3: Package GV5

■ Options available

- Flue gas thermostat - Package GV21
- Interactive remote control CDI 2 with room temperature sensor (package FM51), remote control with room temperature sensor (package FM52)

> **i** An interactive remote control CDI 2 (package CDI 2 (FM51)) and/or a simplified remote control (package FM52) may be connected for each circuit controlled by the boiler.

- Armoured connecting cable (length 40 metres) for connecting DIEMATIC VM or boiler cascade configuration (package DB119)
- TELCOM telephone remote relay
- **For the connection of one or two circuits with mixer valve**: 1 or 2 PCB + sensor option(s) for 1 valve (package FM48)
- Air filter - Package GR8
- Horizontal forced flue
- Vertical forced flue
- Leak tightness control on gas block (5 and 6 section only) - Package GV26
- Minimum gas pressure switch (3 to 4 sections) - Package GV22
- Minimum gas pressure switch (5 to 6 sections) - Package GV25
- Condensate neutralisation system with lift pump (Pn<120 kW - Package DU13, 120<Pn<350 kW - Package DU14, Pn >350 kW - Package DU15)
- Condensate neutralisation system without lift pump (Package BP52)
- Expansion valve GDJ 50 300 - 20 mbar (8802-7177) or GDJ 25 300 - 20 mbar (100011223)
- Flue gas valve - Package GV24
- Propane conversion kit (3 to 4 sections) - Package GV23
- Propane conversion kit (5 to 6 sections) - Package GV27
- Second return kit (Package GR5)

4.3 Mounting

4.3.1 Position of the boiler

■ Location of the installation

C 230 ECO boilers must be installed in a frost-free room.

In order to avoid damage to the boiler, it is necessary to prevent the contamination of combustion air by chlorine and/or fluoride compounds, which are particularly corrosive. These compounds are present, for example, in aerosol sprays, paints, solvents, cleaning products, washing products, detergents, glues, snow clearing salts, etc.
Therefore:
- Do not suck in air evacuated from premises using such products: hairdressing salons, dry cleaners, industrial premises (solvents), premises containing refrigeration systems (risk of refrigerant leakage), etc.
- Do not stock such products close to the boilers.
If the boiler and/or peripheral equipment are corroded by such chloride or fluoride compounds, the contractual guarantee cannot be applied.

The warranty does not apply to damage to the boiler caused by these instances. If the heating device is installed in residential premises where people are present all the time, it is necessary to use a concentric ambient air inlet / combustion gas evacuation installation. When installing the boiler, it is necessary to comply with degree of protection IP21.

■ Position of the boiler

The boiler is delivered fully assembled as standard, covered with plastic wrap, in a pallet crate (70x130 cm), enabling easy handling with a pallet stacker.

This crate is designed to facilitate handling of the unit and to help in the positioning of the boiler.

The standard packaging enables access to doors of 745 mm.

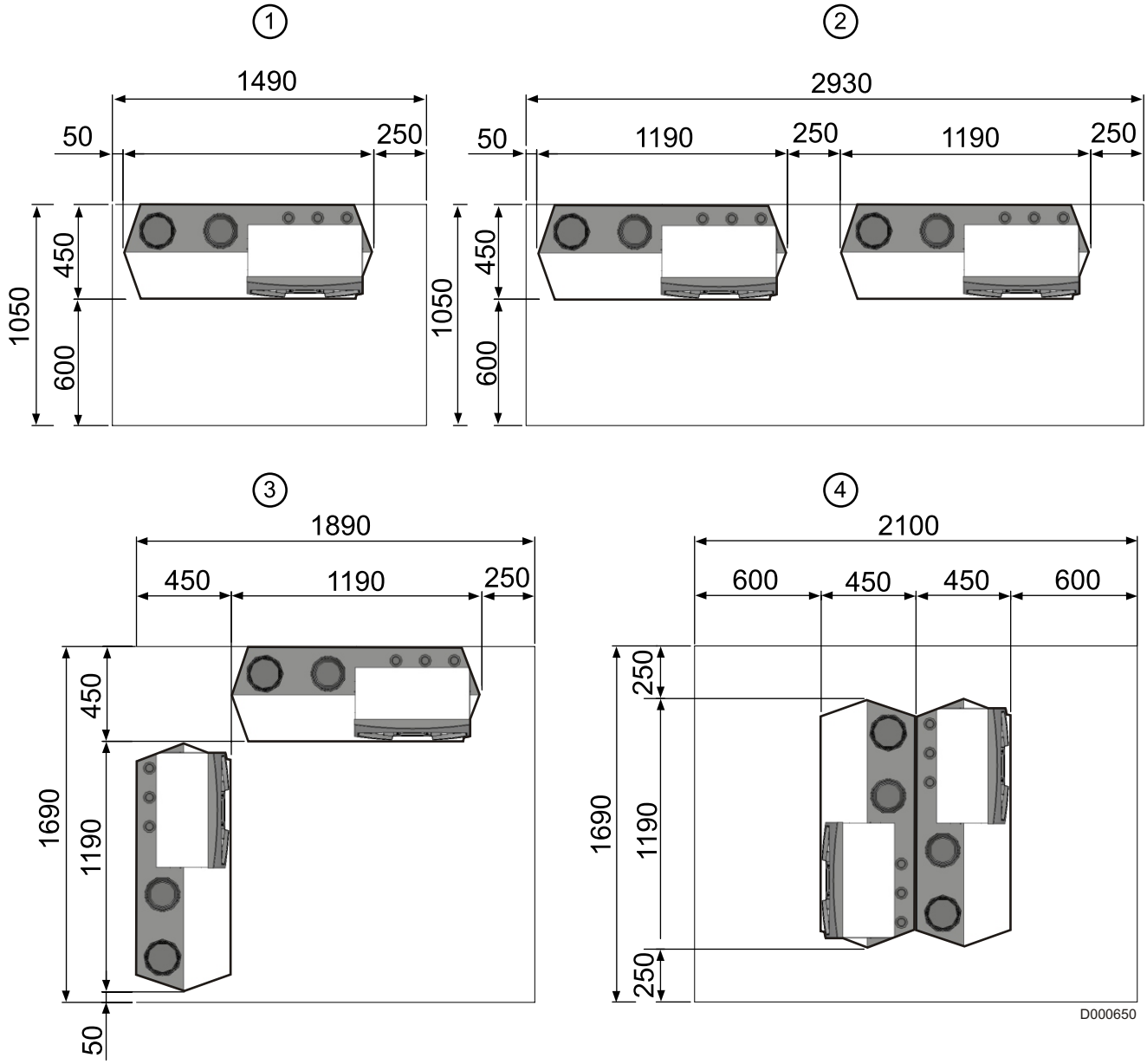
The C 230 ECO can be positioned as follows:

- Place the pallet close to the final installation position.
- Remove the packaging.
- Place the boiler in its final position.

■ Example of an installation

The minimum recommended dimensions are as follows:

- Front: 600 mm
- Top: 400 mm
- Left: 50 mm
- Right: 250 mm



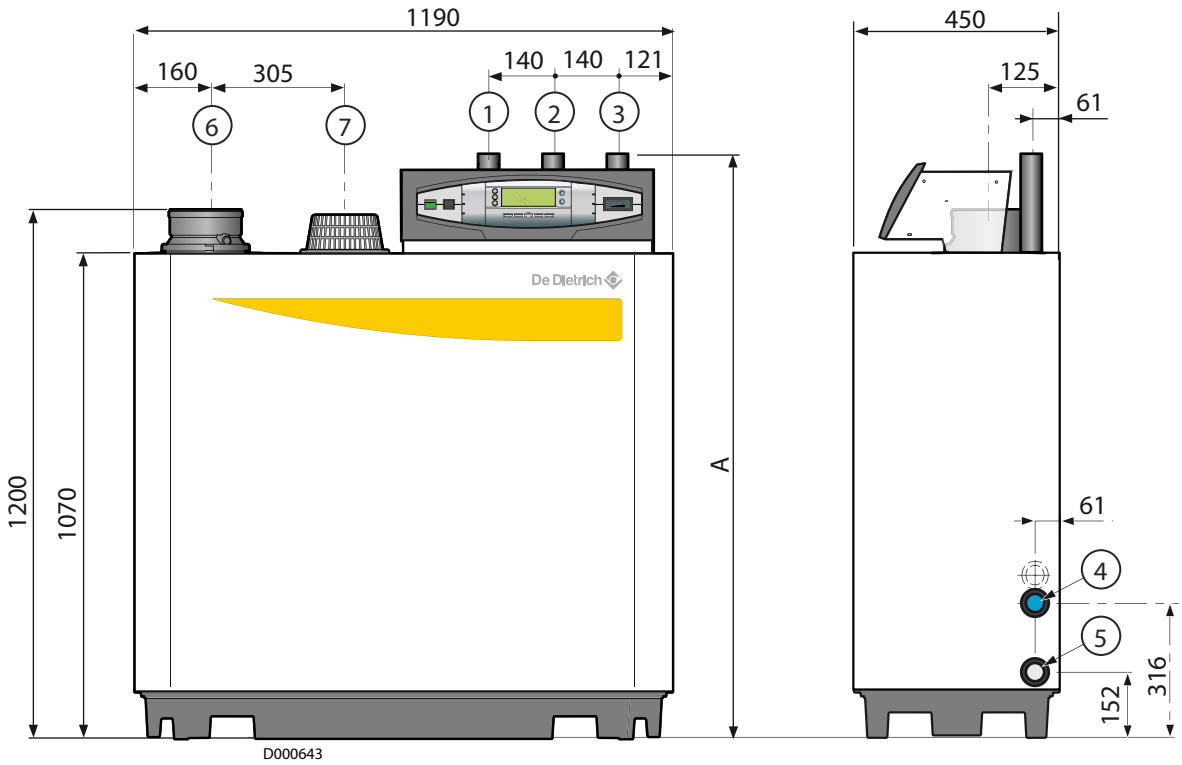
① Installing 1 boiler(s)

② Installing 2 boiler(s)

③ Installing 2 boiler(s)

④ Installing 2 boiler(s) back to back

4.3.2 Main dimensions



① Heating outlet
② Heating return
③ Gas inlet R 1 1/4
④ Filling and emptying tap / Connection for second return
⑤ Flow of condensates siphon delivered ext Ø 32 mm
⑥ Flue gas nozzle Ø 150
⑦ Combustion air inlet

Boiler type	A	①	②
C230-85	1290	R 1 1/4	R 1 1/4
C230-130	1290	R 1 1/4	R 1 1/4
C230-170	1290	R 1 1/4	R 1 1/4
C230-210	1305	R 1 1/2 (1)	R 1 1/2 (1)

(1) Diameter obtained using 2 1"1/2 - 1"1/4 reductions supplied with the boiler (in the polystyrene packaging block).

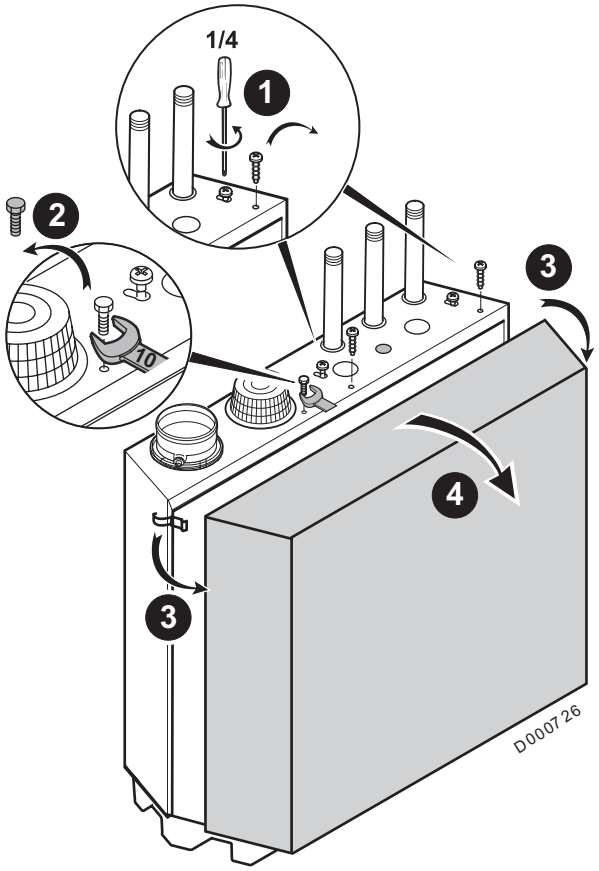
4.3.3 Control panel assembly

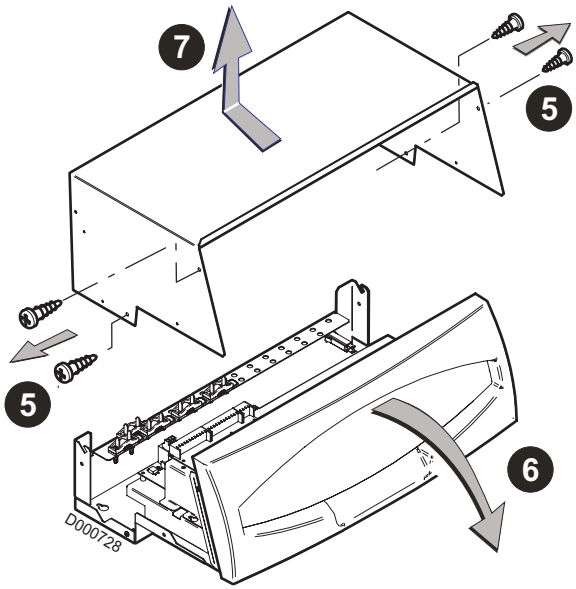
Two types of control panel are available:

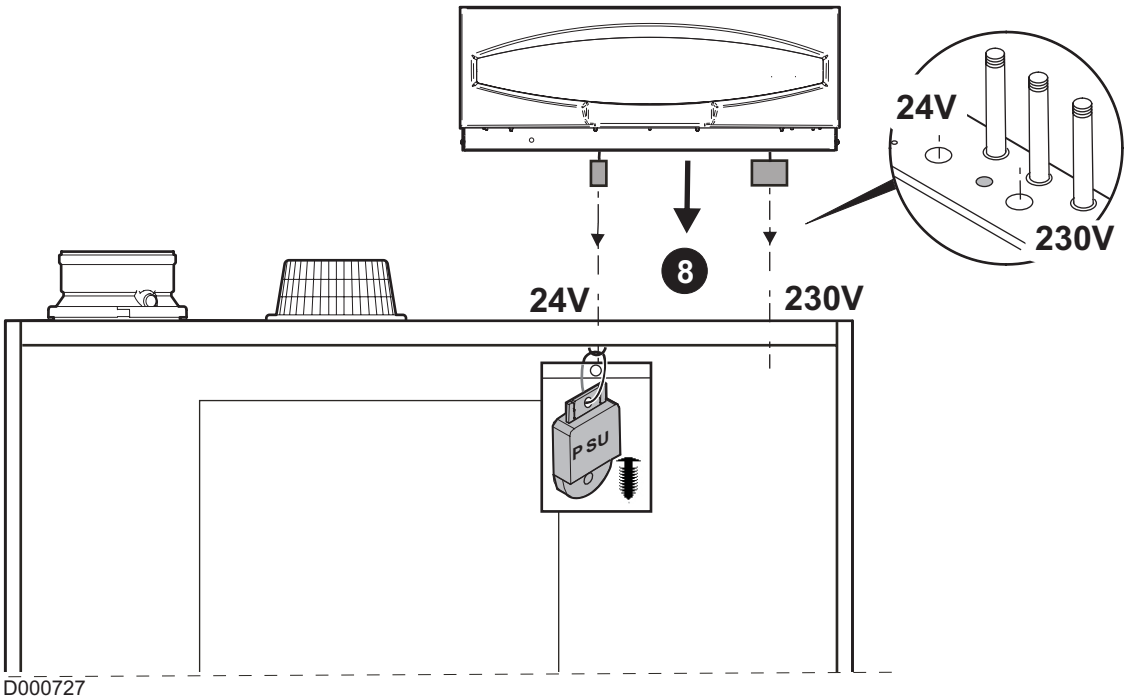
- Panel DIEMATIC-m3 Package GV6: Control panel intended for use with single boilers or master boilers as part of a cascade installation.
- Panel K3 Package GV5: Control panel intended for secondary boilers in a cascade installation.

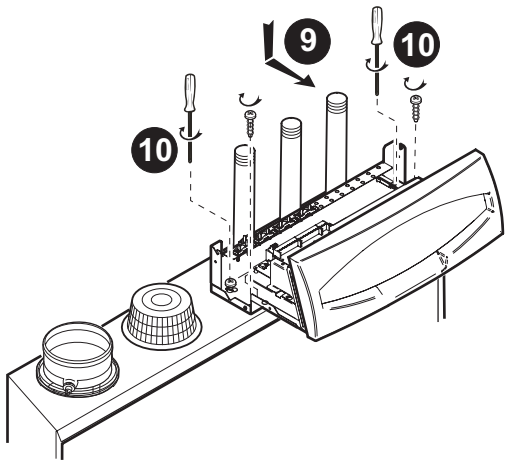
Panel K3 may not be used on one boiler only.

■ Installation of the panel on the boiler









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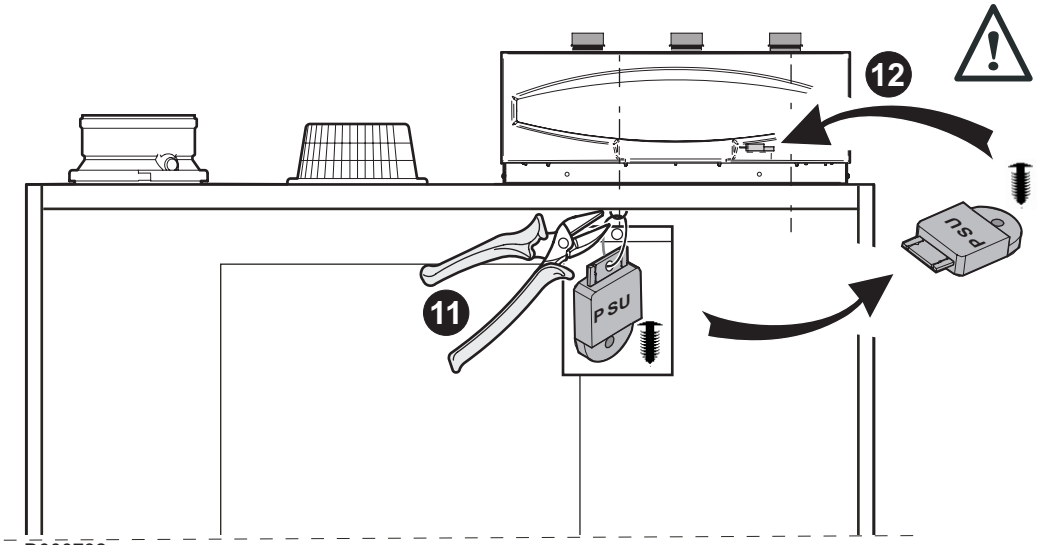

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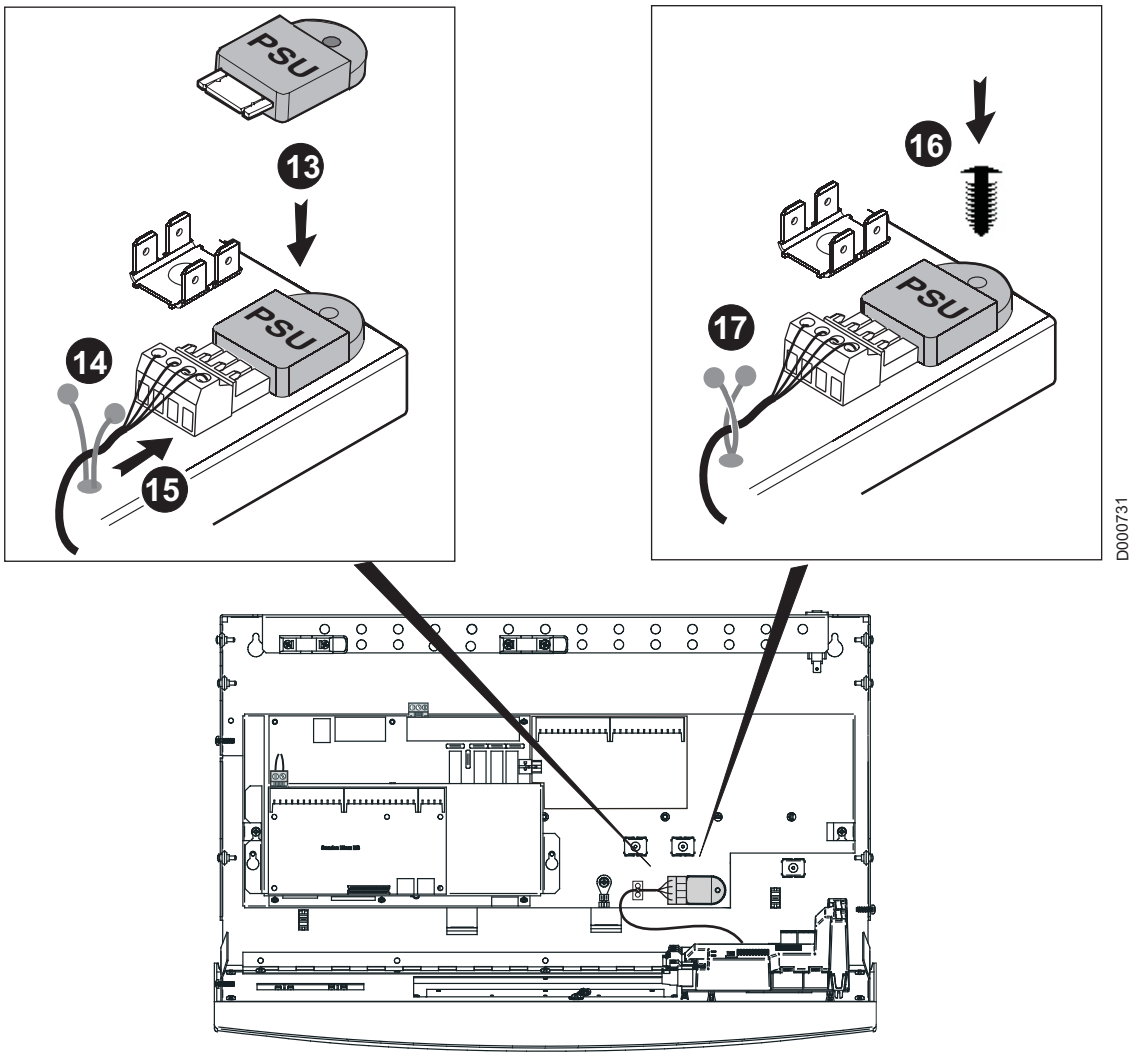
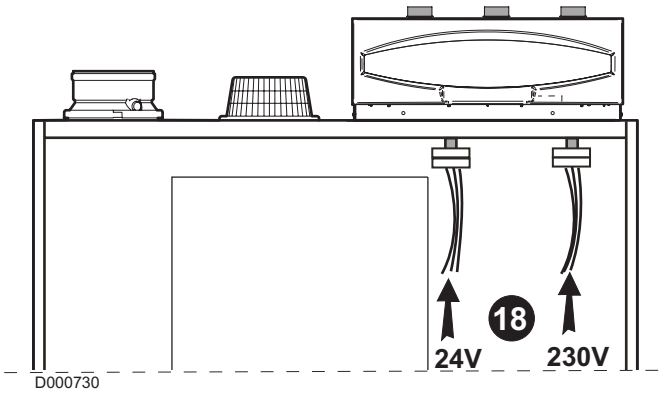




Take the PSU delivered with the boiler and connect it to the position provided in the control panel.
If the PSU is not connected, the boiler does not start.

External connection - Refer to the connection instructions supplied with the control panel..

4.4 Hydraulic connections

4.4.1 Regulations

Installation must be carried out in accordance with the prevailing regulations, the codes of practice and the recommendations in these instructions.

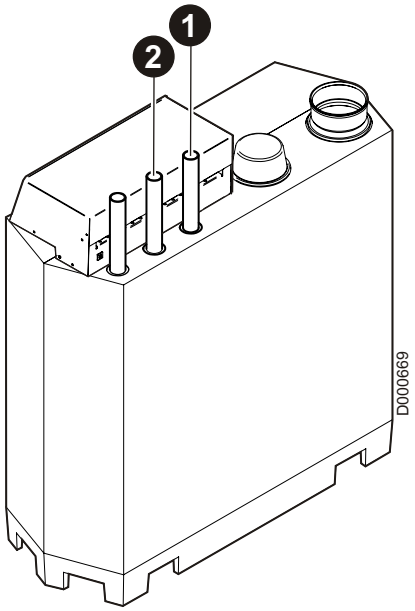
■ Installing the boiler in new installations (installations less than 6 months old)

- Clean the installation with a universal cleaner to eliminate debris from the appliance (copper, tow, brazing flux).
- Thoroughly rinse the installation until the water runs clear and shows no impurities.

■ Installing the boiler in existing installations

- Remove sludge from the installation.
- Rinse the installation.
- Clean the installation with a universal cleaner to eliminate debris from the appliance (copper, tow, brazing flux).
- Thoroughly rinse the installation until the water runs clear and shows no impurities.

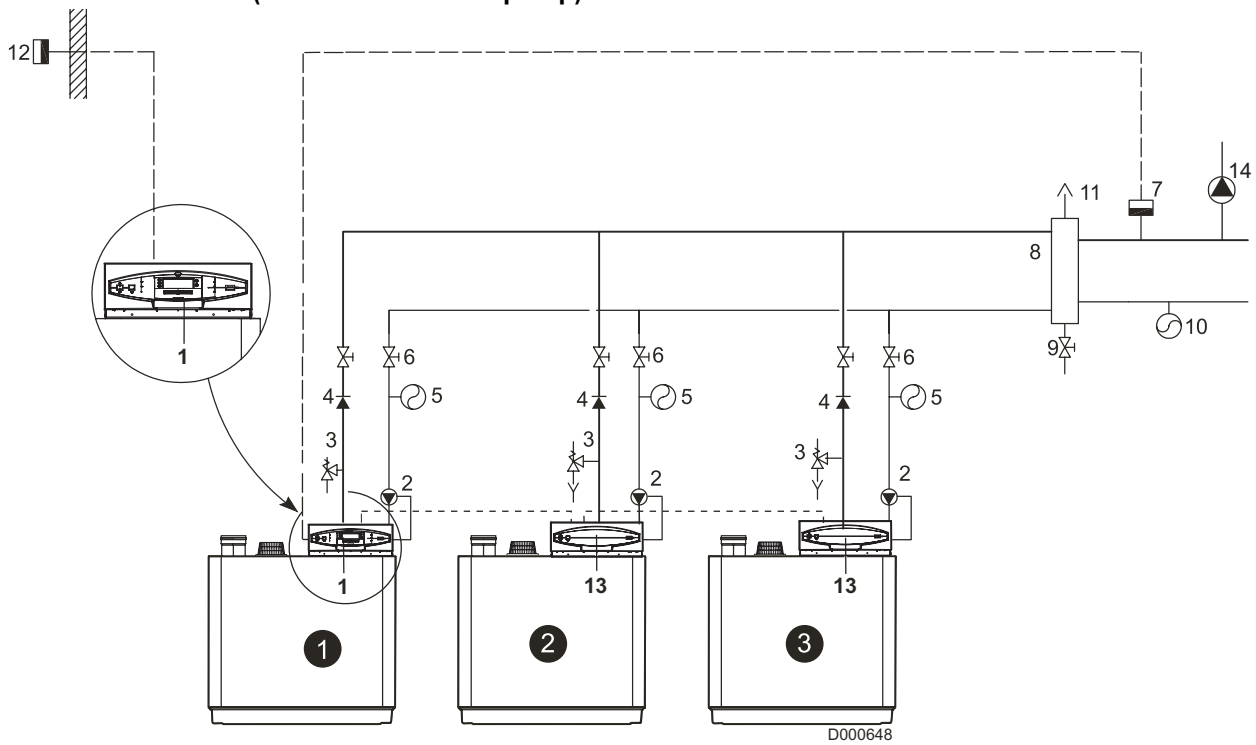
4.4.2 Hydraulic connection of the heating circuit



❶ Flow connection

❷ Return connection

■ Cascade installation (Gate valve + Boiler pump)



1. Master boiler + Control panel DIEMATIC-m3
2. Secondary boiler + Control panel K3
3. Secondary boiler + Control panel K3

1	Control panel DIEMATIC-m3	**8**	Low loss header
2	Injection pump	**9**	Drain cock
3	Safety valve	**10**	Expansion vessel Installation
4	Non-return valve	**11**	Automatic air vent
5	Expansion vessel	**12**	Outside sensor
6	Gate valve	**13**	Control panel K3
7	Outlet sensor (Cascade)	**14**	Network pump VM (Optional)

- Injection pump connected to the boiler pump outlet.
- Gate valve connected to the gate valve outlet.
- Common outlet sensor to be connected to the E.AUX1 input on boiler ①.
  Set:
  #CONFIGURATION: **E.AUX1: CASC:**
- VM **14** network pump (if necessary) connected to outlet ▶ AUX 3.
  Set:
  #CONFIGURATION: **S.AUX3: VM PUMP**
- Complete cascade system up to 10 boilers

i The 14 network pump switches on when at least one DIEMATIC-VM is required for heating.

i The cascade outlet sensor can also be connected to inputs E.AUX2 or E.UNIV. To do so:

Set:

▸**#CONFIGURATION**: **E.AUX2: CASC:**

or

▸**#CONFIGURATION**: **E.UNIV: CASC:**

i Pump VM **14** can also be connected to outlets ▶ AUX 1 or ▶ AUX 2.

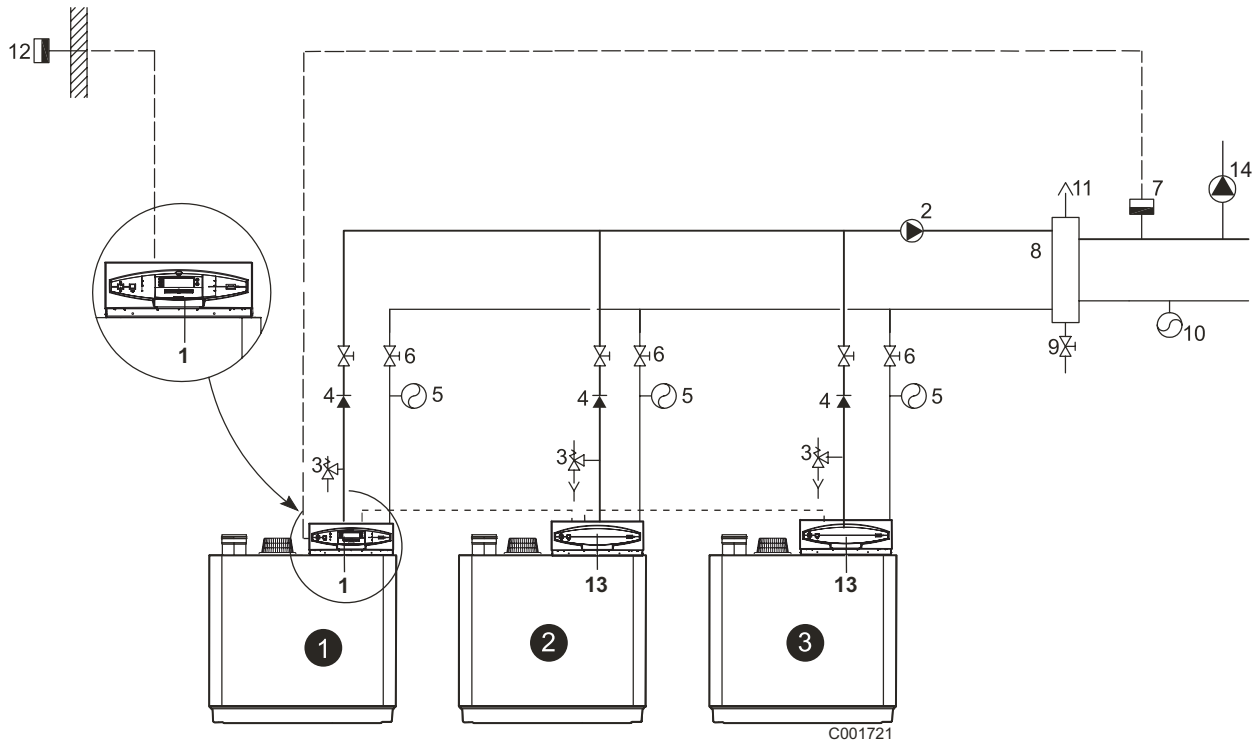
Set:

▸**#CONFIGURATION**: **S.AUX1: VM PUMP**

or

▸**#CONFIGURATION**: **S.AUX2: VM PUMP**

■ Cascade installation (Gate valve + Primary pump)



❶ Master boiler + Control panel DIEMATIC-m3

❷ Secondary boiler + Control panel K3

❸ Secondary boiler + Control panel K3

1	Control panel DIEMATIC-m3	**8**	Low loss header
2	Primary pump	**9**	Drain cock
3	Safety valve	**10**	Expansion vessel Installation
4	Non-return valve	**11**	Automatic air vent
5	Expansion vessel	**12**	Outside sensor
6	Gate valve	**13**	Control panel K3
7	Cascade outlet sensor	**14**	Network pump VM (Optional)

▸ Primary pump connected to outlet ▶ AUX 3 (1)

▸ Gate valve connected to the gate valve outlet

(1) Outlet **S.AUX3:** is set in the factory to **PRIM.P**

i The primary pump can also be connected to outlets ▶ AUX 1, ▶ AUX 2.

Set:

▸**#CONFIGURATION**: **S.AUX1: PRIM.P**

or

▸**#CONFIGURATION**: **S.AUX2: PRIM.P**

i Pump VM **14** can be connected to one of the AUX outlets not used by the primary pump.

Set:

▸**#CONFIGURATION**: **S.AUX1:**, **S.AUX2:**, **S.AUX3:** on **VM PUMP**

4.4.3 Connecting the condensate discharge pipe

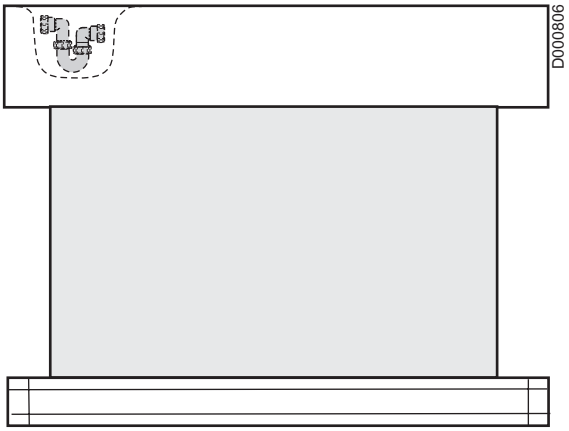
Discharge condensation water directly into the main drain.

Given the degree of acidity (pH 3-5), use only plastic materials to make the connection.

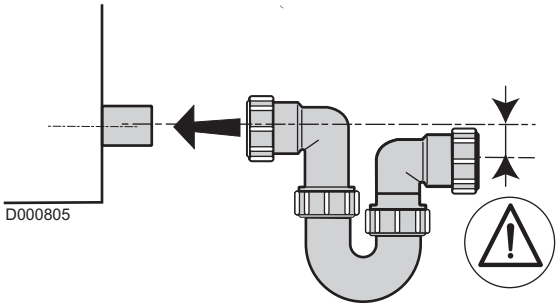
Fill the siphon with water. Make the connection to the main drain with a visible flow connection.

The discharge duct must have a minimum gradient of 30 mm/m. The discharge of condensation water via the gutter is not authorised, given the risk of frost and the damage to the materials usually used for gutters.

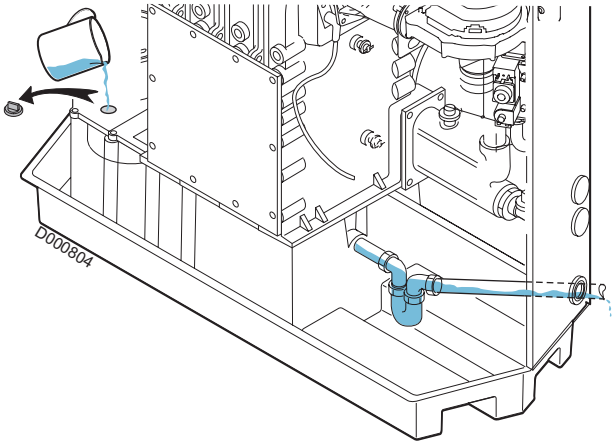
■ **Emplacement of the siphon**



■ **Siphon assembly**



■ **Filling the siphon**



4.4.4 Water treatment

Specifications required for the heating water.

Degree of acidity (water non-treated)	6.5 - 8.5 pH
Degree of acidity (water treated)	7 - 9 pH
Conductivity	≤ 500 µS/cm to 25°C
Chlorides	≤ 20 mg/l
Oxygen	≤ 0.1 mg/l
Other components	< 1 ppm

Water hardness Installation: Flow temperature output 60°C				
	Concentration (on first load)			Concentration (top up)
Useful output Pn (kW)	mmol/l	°dH	°f	mmol/l
≤ 70	0.5-3.5	2.8-20	5-35	0.5-3.5
70-200	0.5-2.0	2.8-11.2	5-20	≤ 1.5
200-550	0.5-1.5	2.8-8.4	5-15	≤ 0.5
> 550	0.4-0.5	2.2-2.8	4-5	≤ 0.5

Remark:
Installation maximum 200 kW, Useful output, Flow temperature output 90°C : Maximum hardness 1.50 mmol/l
Installation > 200 kW, Useful output, Flow temperature output 90°C : Maximum hardness 0.50 mmol/l

If, however, the installation requires water treatment: consult us, particularly for:

- The treatment of the water is in compliance with the use of the materials used in the construction of the boiler with an aluminium heating body.
- The precautions to be taken to prevent the formation and localisation of oxygen in the water in the installation.
- Antifreeze products: ensure that these are compatible with aluminium and, if need be, with other components in the installation.

If necessary, our Technical Department is at your disposal.

Renovation of old boiler rooms

If connecting the installation to an old network, we strongly recommend that you "clear sludge out" of the system before installing the new boiler.

After carrying out this work, particular monitoring of the installation may be necessary both in respect of the water in the network and the quality of the water used for topping it up in order to be in full control of the consequences.

Suitable filters may be necessary in some cases.

4.4.5 Circulating pump

The C 230 ECO is not fitted with one of these, but the DIEMATIC-m3 makes it possible to control a external pump.

The water resistance at ΔT to 20 K is as follows:

C 230-85	165 mbar
C 230-130	135 mbar
C 230-170	170 mbar
C 230-210	180 mbar

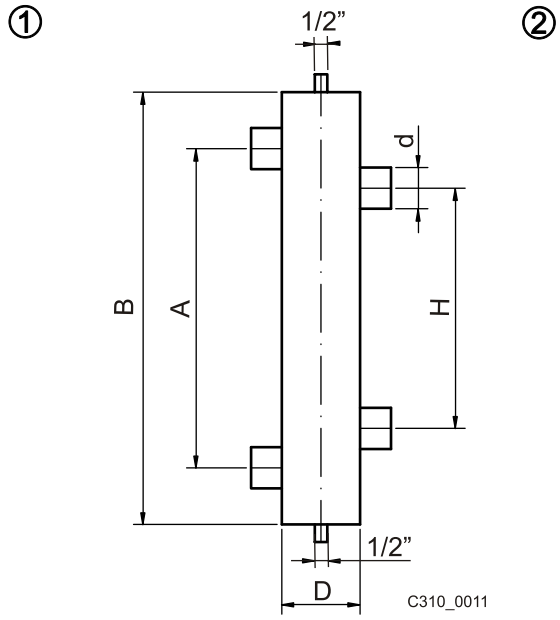
4.4.6 Low loss header

Please refer to the prevailing regulations in your country.

Low loss header

① Boiler side

② Installation side



Useful output output	Flow rate	Ø D		Square D	d interior	H	A	B
kW	m^3/h	inch	DN	mm	inch	mm	mm	mm
80	3.4	3	80	70	1 1/4	280	370	510
120	5.2	4	100	90	2	350	465	630
160	6.9	4	100	100	2	350	465	630
200	8.6	5	125	110	2 1/2	440	580	770
240	10.3	5	125	120	2 1/2	440	580	770
280	12.0	6	150	130	2 1/2	440	580	770
320	13.8	6	150	140	2 1/2	440	580	770
360	15.5	6	150	150	2 1/2	440	580	770
400	17.2	8	200	160	2 1/2	440	580	770
440	18.9	8	200	170	3	540	720	900
480	20.6	8	200	170	3	540	720	900
520	22.4	8	200	180	3	540	720	900
560	24.1	8	200	190	3	540	720	900
600	25.8	8	200	190	3	540	720	900
640	27.5	10	250	200	3	540	720	900

4.5 Gas connection

The boiler is designed for the combustion of all qualities of 2nd family natural gas and propane after conversion using the propane conversion kit (Option).

The boiler must be connected to the gas pipe compliance with the prevailing regulations. A main gas valve must be provided close to the boiler.

Install a gas filter on the gas supply pipe to prevent fouling of the combined gas valve unit.

Respect the prevailing standards and regulations particularly the order of 2 August 1977 (Only in France).

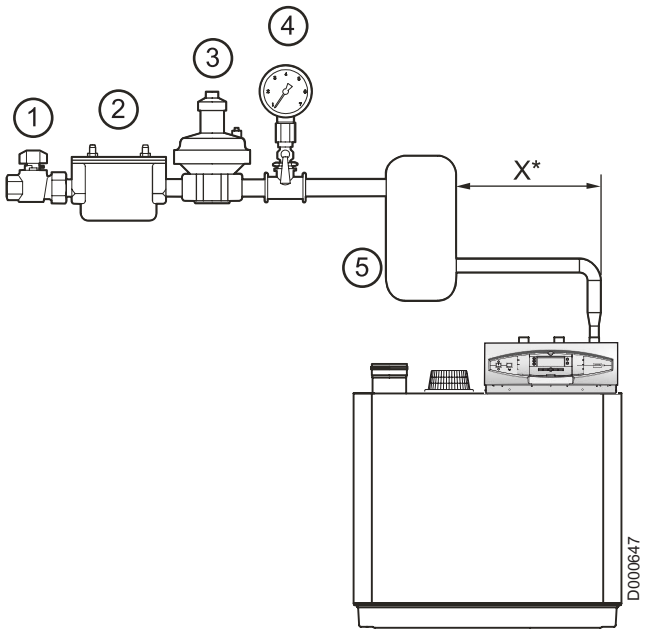
Gas supply:

- The gas connection is located at top right on the back of the boiler. Connection diameter (1"1/4) male.

Install a gas filter on the gas supply pipe to prevent fouling of the combined gas valve unit.

The boiler can handle gas pressures of between 17 and 25 mbar.

For higher pressures and connection to a 300 mbar network, fit a regulator (optional).



1. Gas cut-off tap
2. Filter
3. Expansion valve
4. 0 manometer to 100 mbar
5. Bottle 1/1000(1)

(1) It is useful to provide a gas reserve in the form of a bottle with a capacity at least equal to 1/1000 of the installation's hourly gas flow before and in immediate proximity to the gas train

The dimension X between the bottle 1/1000 and the boiler will be as small as possible.

The connection pipes between the regulator unit and the boiler must be calculated according to the output of the boiler and the length of the piping!

4.6 Flue gas system connections

4.6.1 Connection options

Prior to installation, it must be decided whether the boiler is to be installed **traditionally** or with a **forced flue**.

4.6.2 Classification of type according to the discharge of combusted gases and air supply

EC classification:

Type B23 / B23p: Traditional unit without cut-off. Air from the room in which the boiler is installed, combusted gas discharge through the roof. Metal or plastic combusted gas evacuation with pictograms CE, complies with pressure class P1.

Type C13: Forced flue unit, connected to the combined outlet on the front.

Type C33: Forced flue unit, connected to the combined outlet to the roof.

Type C43: Forced flue unit with cascade coupling, connected to a common air inlet and combusted gas discharge duct (system 3 CE).

Type C53: Forced flue unit, connected to different air inlet and combusted gas discharge ducts, coming out in areas of different pressure.

Type C63: Force flue unit, sold without equipment for connection and/or outlet.

Type C83: Forced flue appliance, connected to a different air inlet and combusted gas discharge duct with a combusted gas discharge duct operating on a vacuum.

4.6.3 Connection conditions

Connecting the combusted gas discharge and air inlet conduits:

The welds and connections used on the combusted gas discharge duct must be watertight.

The horizontal sections must be inclined towards the boiler (minimum 5 mm per metre).

Combusted gas evacuation ducts of more than 2 m must be secured separately and not rest on the boiler.

Materials used:

Combusted gas evacuation systems must preferably be made of plastic.

If using other systems, the following materials may be used:

- With a single, rigid or flexible outer casing: aluminium, stainless steel or even plastic.
- Hose: stainless steel or plastic.

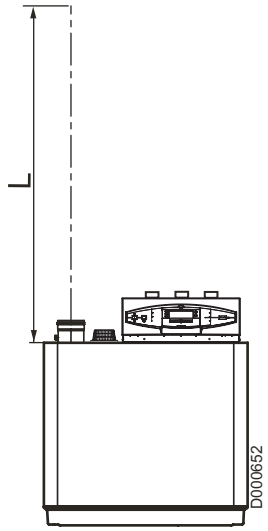
A broad range of flue gas system accessories is available as optional equipment.

4.6.4 Connection to a type B23 / B23p chimney

- Respect the prevailing standards and regulations particularly the order of 2 August 1977.
- Particularly the order of 22 October 1969 (FRANCE)
- DTU 24.1 - Flue gas system fittings(FRANCE)
- On traditional installations, the fresh air required for combustion comes directly from the room in which the boiler has been installed.
- A nozzle is provided for connection to the duct.
- The flue gas duct must be airtight and watertight and must be constructed in such a way as to allow the discharge of condensates.
- The horizontal sections will be constructed with a gradient of 5 mm per metre.
- The chimney must be lined.
- At the lowest points, provide a siphon for the discharge of condensates.
- By way of an example, the table below gives the dimension L developed in the flue gas discharge duct according to the connection diameters and according to concept (see below table).

Installation of the combusted gas discharge duct

Duct without elbows



"Max." total length developed in the flue gas discharge duct in metres (L)	
D (mm)	**Outlet without hood (open 'free')**
	1
C230-85	
100	18
110	35
130	+
C230-130	
110	20
130	48
150	+
C230-170	
130	22
150	45
180	+
C230-210	
130	14
150	31
180	+

+ = Lengths up to 50 metres (more than this: consult us)

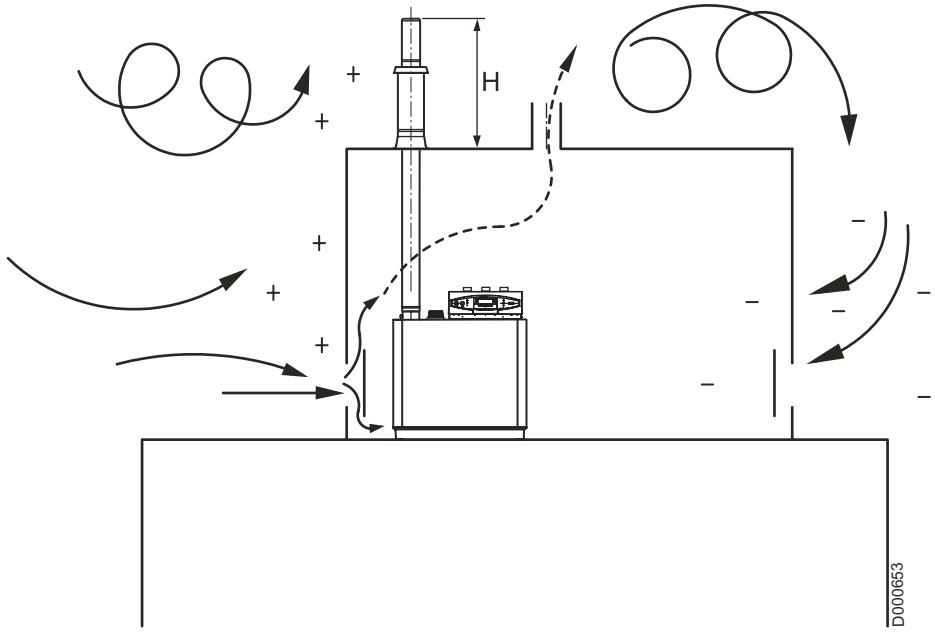
- = not possible

At each additional elbow of 90° or 45°, subtract the length given in the following table.

D (mm)		Length	
		Elbow 90°	**Elbow 45°**
Ø 100	R = 1/2D	4,9	1,4
Ø 110	R = 1/2D	5,4	1,5
Ø 130	R = D	1,8	1,0
Ø 150	R = D	2,1	1,2
Ø 180	R = D	2,5	1,4

- With a terrace installation, it is essential to provide two low ventilation vents diagonally opposite each other in order to prevent vacuums in the boiler room caused by wind eddies.

- If the boiler room is installed in the top section of the main building, a low chimney is sufficient.



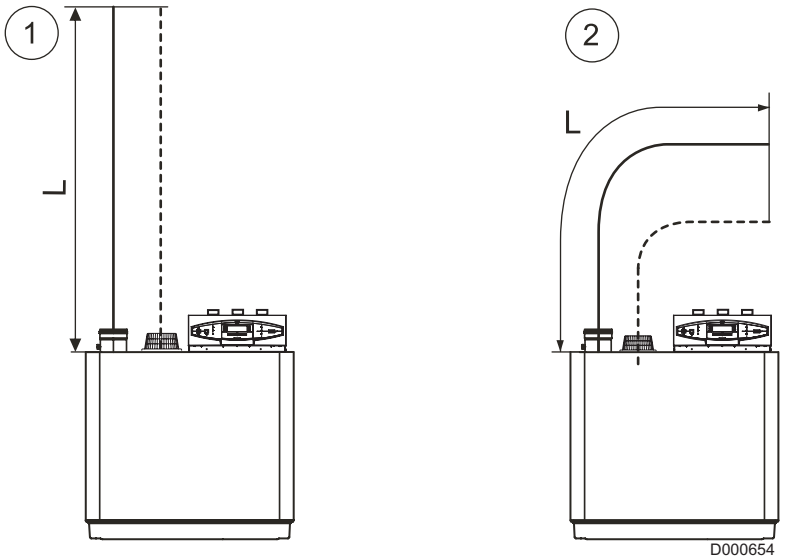
- Buildings up to 15m: H greater than or equal to 1 m above the roof of the boiler room
- Buildings of 15 to 45 m: H greater than or equal to 1.5 m above the roof of the boiler room
- Buildings of more than 45 m: H greater than or equal to 2 m above the roof of the boiler room

4.6.5 Forced flue connection type C13 and C33

In an installation with a vertical or horizontal forced flue, it is essential always to ensure that emissions do not trouble the immediate vicinity of the combustion by-product outlet.

No regular presence of physical persons, height of the emissions greater than 2 metres, no windows nearby, etc...

- The flue gas duct must be airtight and watertight and must be constructed in such a way as to allow the discharge of condensates.
- The horizontal sections will be constructed with a gradient of 5 mm per metre.
- By way of an example, the table below gives the dimension L according to the connection diameters and according to concept (see below table).



Installation of the combusted gas discharge and air supply ducts

① Vertical forced flue

② Horizontal forced flue

Dimension L includes the air duct and the flue gas discharge duct in metres				
Models	Ø D (mm)	Calculated with a forced flue Ø Dnominal (mm)	Situation	
			1	2
C230-85	100	100	8	-
	130	130	+	-
	130	150	+	-
	150	150	+	+
C230-130	100	100	3	-
	130	130	22	-
	130	150	25	-
	150	150	+	34
C230-170	130	150	11	-
	150	150	22	13
	180	150	+	-
C230-210	130	130	4	-
	150	150	13	11
	180	150	+	29

+ = length up to 30 metres (consult us for longer lengths)

- = not possible

i At each additional elbow of 90° or 45°, subtract the length given in the following table.

D (mm)		Length	
		Elbow 90°	Elbow 45°
Ø 100	R = 1/2D	4,9	1,4
Ø 110	R = 1/2D	5,4	1,5
Ø 130	R = D	1,8	1,0
Ø 150	R = D	2,1	1,2
Ø 180	R = D	2,5	1,4

4.6.6 Forced flue equipment (optional)

Two types of forced flue are available: vertical or horizontal.

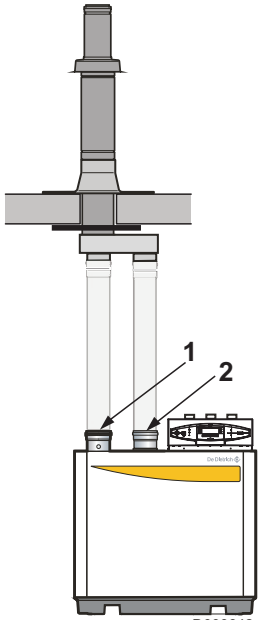
The equipment includes the terminal section of the duct comprising 2 concentric pipes: the internal pipe for combusted gas discharge, the external pipe for combustive air supply.

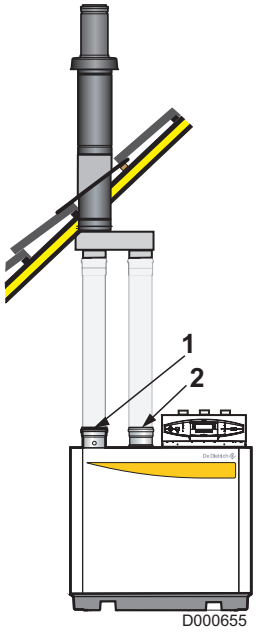
The connections between the forced flue and the boiler are not supplied; they must be constructed by the fitter.

The material used must have specifications compatible with the acidity of the condensate.

The combustive air supply pipe must be watertight.

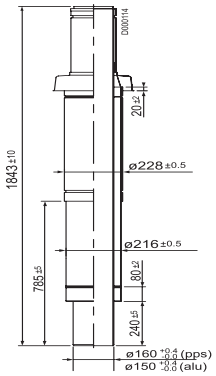
Our technical department is at your disposal to look at any specific forms of installation that you may wish to submit.

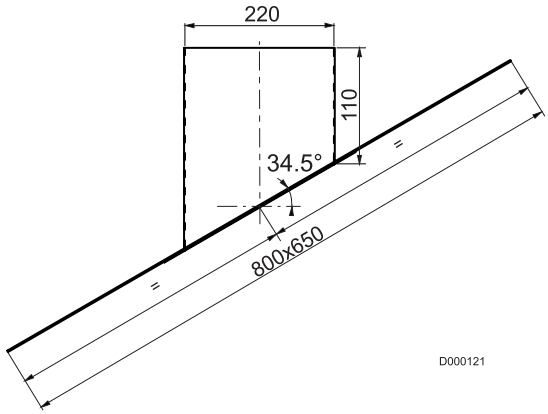


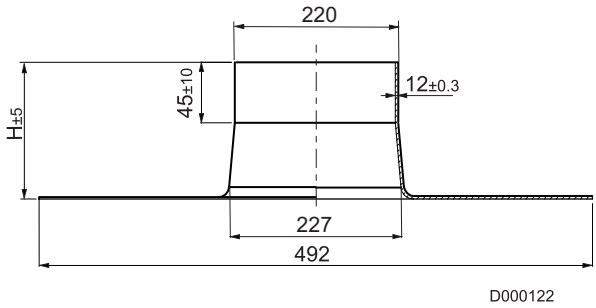


1. Adapter Ø150/160 mm (for PPS only)
2. Air connection part for forced flue + Adapter Ø150/160 mm (for PPS only)

Dimensions of the vertical forced flue with flashing

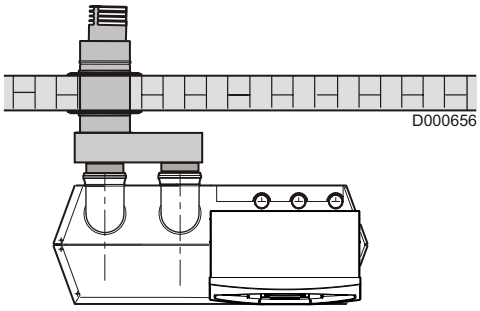


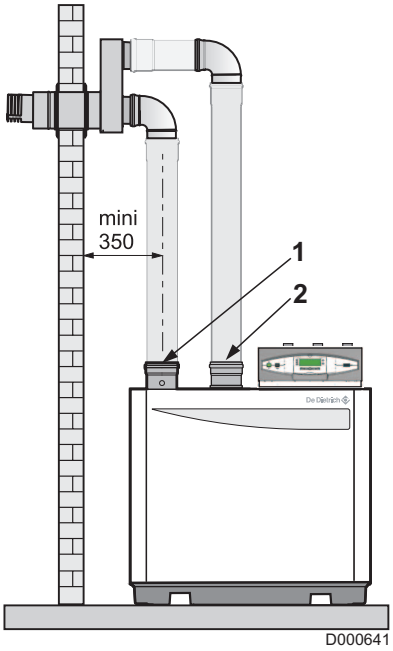




Horizontal forced flue

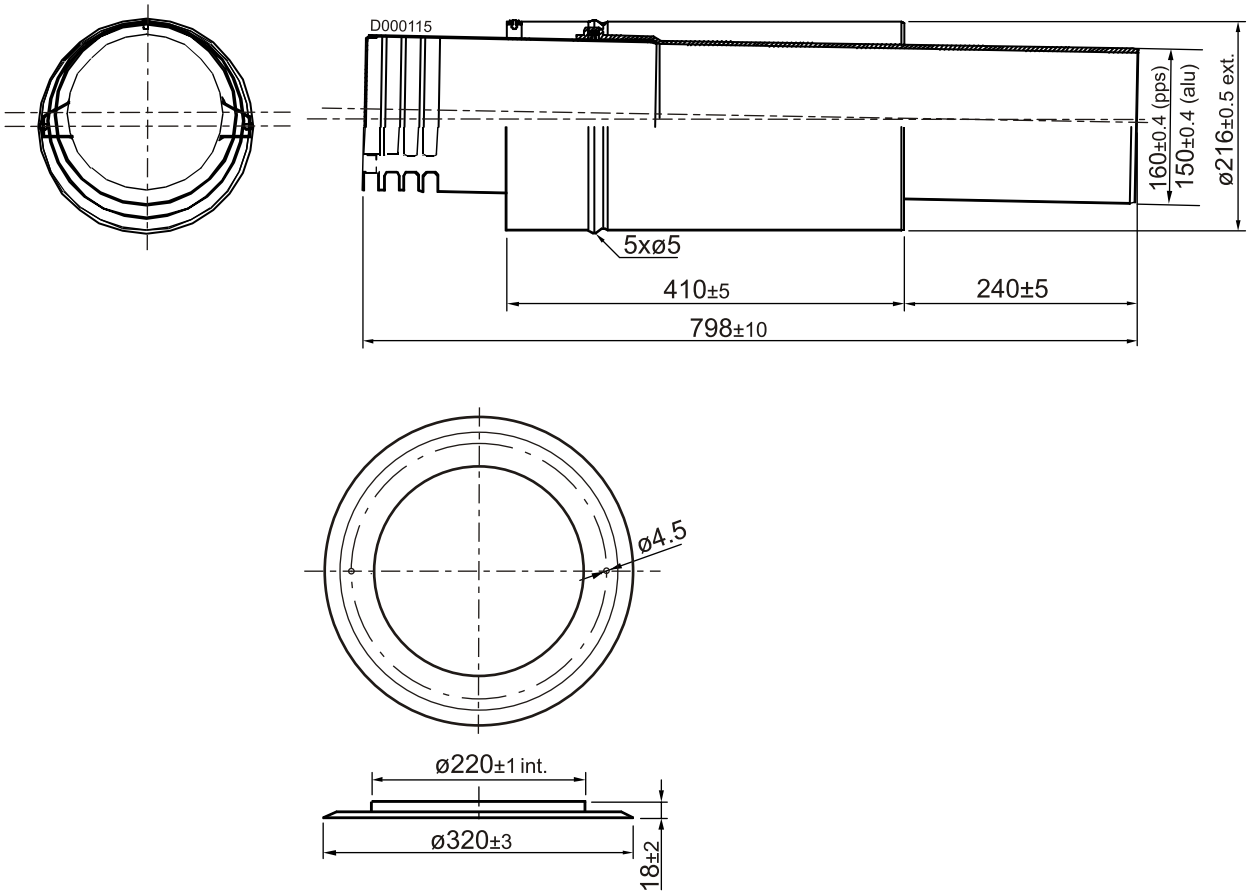
Not authorised in Germany



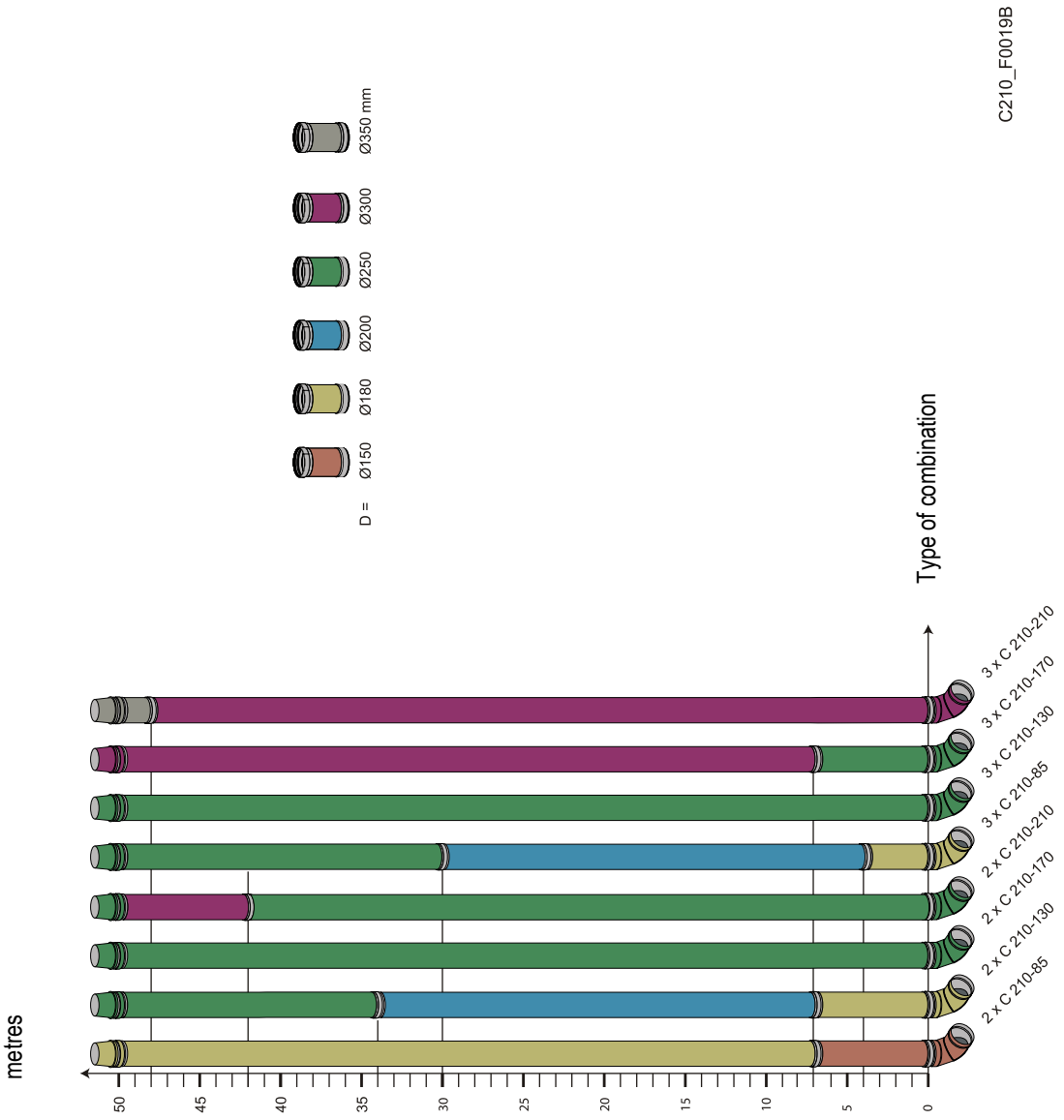


1. Adapter Ø150/160 mm (for PPS only)
2. Air connection part for forced flue + Adapter Ø150/160 mm (for PPS only)

Dimensions of the horizontal forced flue



L max as a function of the Ø of conduit D for different "cascade" combinations

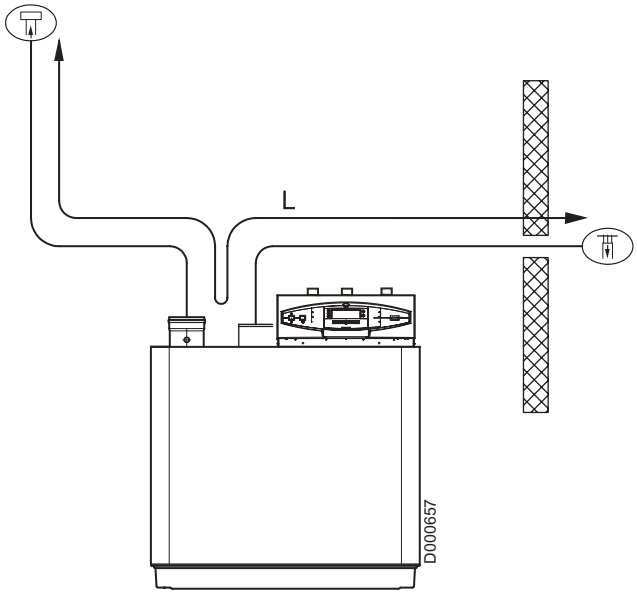


4.6.7 Connecting separate type C53 ducts

Distinct air inlet and combusted gas discharge ducts, coming out in areas with different pressure can be considered with the exception of "coastal areas"[1].

The maximum height difference between the combustive air inlet and the combusted gas discharge is 36 m and the maximum authorised length of the combustive air inlet and the combusted gas discharge combined is given in "Connecting of forced flue" table.

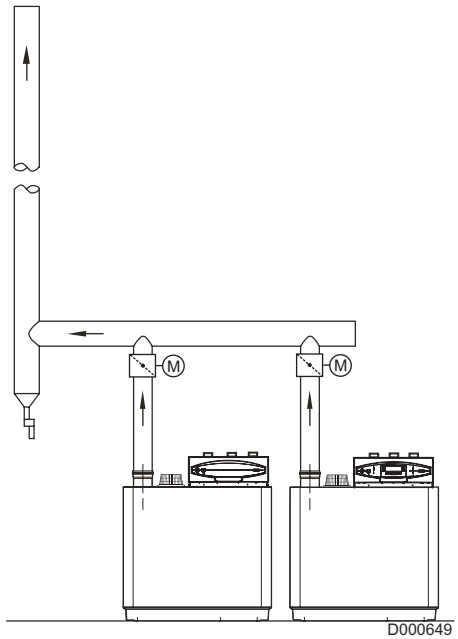
(1) Specific case to be resolved: consult us



Dimension L includes the air duct and the flue gas discharge duct in metres		
	D (mm)	metres
C 230-85	150	36
C 230-130	150	36
C 230-170	150	23
C 230-210	150	11

4.6.8 Installation of 2 boilers in cascade

Typical systems: **Connection to a chimney Type B23 / B23p**



M : Flue gas valve (Option)

4.7 Electrical connections

4.7.1 General

As the electrical wiring has been carefuly checked in the factory, the internal connections on the control panel must not be changed in any way.

Only qualified professionnals may carry out electrical connections, always with the power off.

Electrical connections must match the electrical diagrams delivered with the equipment and comply with the instructions in the manual.

Installation and electrical connections are to be made in accordance with existing regulations. The appliance must be powered by a circuit containing an omnipolar switch with an opening distance 3 mm. The earth connection shall comply with standard NFC 15100.

All connections are made with the terminal boxes designed for that purpose on the back of the boiler's command board.

The connection cables should be fed into the panels through the opening provided.

These cables will be fixed on to the control panel with cable clips (supplied in a separate bag).

Low voltage controls :
The maximum current which may be switched per output is 2A with cos φ = 0.7 (= 450W establishing current below 16A). If the load exceeds either of these values, the control must be relayed using a contactor that must not be installed in the Diematic 3 control panel under any circumstances.

The sensor cables have to be separated from the 230V circuit cables.
Outside the boiler : Use 2 pipes or cable guides at least 10 cm apart

4.7.2 Electrical specifications

■ Power supply voltage

The C 230 ECO is designed to work on 230V-50Hz with a live/neutral/ earth system. Other voltages are only authorised if using a separation transformer.

The earthwire must be longer than 8 mm that L and N wire.

■ Safety box

Mains voltage: 230 V / 50 Hz

Safety time: 3.5 seconds

Pre-sweep time: 20 seconds

Post-sweep time: 20 seconds

Anti-short cycle time: 1 to 10 minutes

■ Power consumption

Power consumption at stop/minimum output/full output:

C 230-85: 7 W / 34 W / 125 W

C 230-130: 7 W / 36 W / 193 W

C 230-170: 7 W / 56 W / 206 W

C 230-210: 7 W / 59 W / 317 W

■ Circuit breaker values

The boiler is fitted with a 4 A circuit breaker.

■ Temperature control

The C 230 ECO is fitted with outlet temperature, return temperature, heating body temperature and combusted gas temperature sensors. These sensors are used to vary boiler output according to the temperatures measured.

The C 230 ECO is fitted with a water flow control device in which the operating principal consists in measuring the water temperature. If ΔT = 30K is reached (factory setting), the boiler reduces its output by modulating to enable the burner to remain in operation as long as possible.From ΔT =40K, the boiler switches itself off, no safety shutdown. A message is then displayed on the DIEMATIC-m3.

■ Maximum temperature safety

The boiler goes into safety shutdown if the temperature is too high (110°C or less). After the breakdown has been repaired, the boiler can be unlocked by pressing the ☜ key.

■ Flue gas pressure switch

The boiler is fitted with a flue gas pressure switch which checks that the combustion products are correctly evacuated. If the chimney is blocked, the pressure switch opens its contact and shuts down the boiler. To restart the boiler, it is necessary to reset the safety control box after correcting the problem (Refer to the connection instructions supplied with the control panel.).

4.8 Skeleton Diagrams

Refer to the connection instructions supplied with the control panel..

5 Start-up

5.1 Control panel

Refer to the connection instructions supplied with the control panel..

5.2 Check points before commissioning

■ Hydraulic circuit

- Check that the installation and boiler are adequately filled with water and correctly irrigated and bled (Pmin: 0.8 mbar).
- Check that the hydraulic connections are leak tight.

■ Gas circuit

- Check that the appliance is properly set for the type of gas used.
- Check the supply pressure.
- Check the tightness of the gas circuit.

■ Electrical connectors

- Check that the connectors under the control panel are correctly fitted.
- Check the presence of PSU in the control panel.
- Check the earth.

5.3 Commissioning procedure

- Ensure that the boiler is switched off
- Remove the front casing
- Open the main gas valve
- Open the boiler control panel (see chapter "Control panel assembly")
- Check the electrical connection
- Fill the installation with water and check hydraulic tightness (Pmin: 0.8 bar)
- Bleed the heating installation
- Fill the condensates siphon with water
- Check the connection of the combusted gas evacuation and the air inlet
- Empty the gas inlet
- Open the gas valve on the gas pipe to the boiler
- Check the gas connection
- Turn the boiler on
- Turn the main switch to ⏻
- The boiler type is displayed on the screen for 5 seconds
- Provoke a heating request
- The boiler starts to operate
- Check the settings (See "Gas settings"). If necessary, correct the settings

5.4 Gas settings

The boiler is preset in the factory to operate on natural gas (Gas H). For operation on natural gas L and propane, it is necessary to carry out a gas conversion and set CO_2.

For operation on propane, carry out the conversion using the optional conversion kit.

See paragraph "Changing gas"

The nominal output and the CO_2 value must be reset.

5.4.1 Checks

Carry out a check at low stage and at high stage on all boiler versions (a check at low stage only on C 230-85 ECO and C 230-130 ECO). For controlling and setting, use a CO_2 analyser (based on O_2). Close the opening around the sensor when taking the measurement.

5.4.2 Fan speed

■ Adjustment

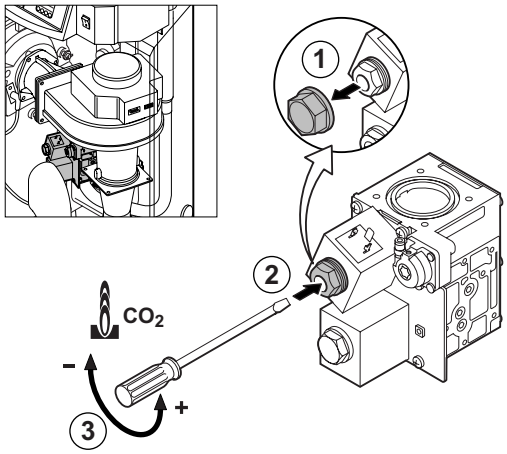
- Press the key until **#CONFIGURATION** is displayed.
- Press successively until **#BOILER** is displayed, then until **MAX.VENT.**, **MIN.VENT.** and **ST.VENT.** are displayed.

If the boilers are in cascade, press the key for the boilers fitted with K3 control panels.

The parameters can be modified with the + and - keys.

5.4.3 Setting the gas/air ratio (High speed)

C230-170 / C230-210



1. Set the boiler to the high stage.
2. Press key , the symbol is displayed.
3. Use keys + and - to switch from to .
4. Measure the percentage of CO_2 and compare it with the value in the table below.
5. If the percentage of CO_2 is different from these values, set the percentage of CO_2 using the screw under the coupling on coil V2 on the gas valve unit (setting possible only for versions C 230-170 ECO and C 230-210 ECO) (see drawing above).
6. Check the flame via the flame inspection window. It must not go out. The surface of the burner must not be red hot.

: Maximum output

: Minimum output

In the display area:

EMISSION MES. 88.8°:Boiler temperature

EMISSION MES. 8888: Fan speed

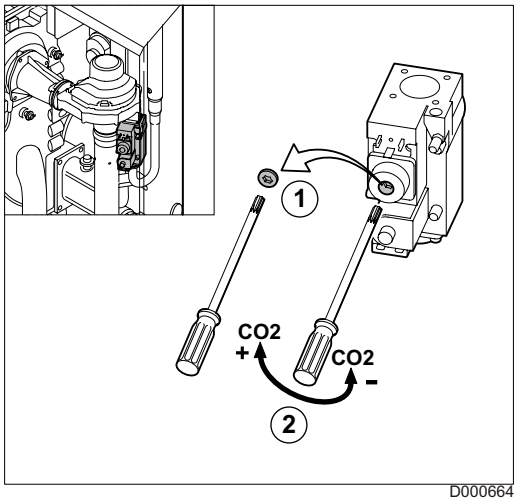
EMISSION MES. 88.8uA: Ionization current

O_2/CO_2 checking and setting value (Open air box)						
Boiler type	Fan rotation speed (rpm)				CO_2 for Gas H Gas L and Gas Lw	CO_2 for Propane
	High speed					
	Gas H	Gas L	Gas Lw	Propane	%	%
C 230-85 ECO	5100	5400	5100	(1)	8.8 ±0.3	(1)
C 230-130 ECO	6400	6500	6400	(1)	8.8 ±0.3	(1)
C 230-170 ECO	4800	4800	4800	(1)	8.8 ±0.3	(1)
C 230-210 ECO	5700	5800	-	(1)	8.8 ±0.3	(1)

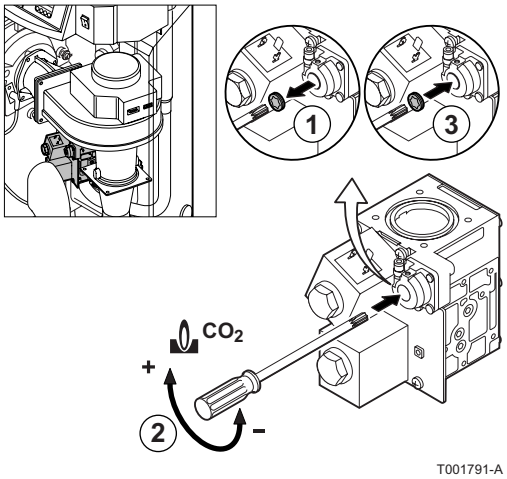
(1) For conversion to propane, refer to the instructions provided with the conversion kit.

5.4.4 Setting the gas/air ratio (Low speed)

C230-85 / C230-130



C230-170 / C230-210



1. Check the boiler on low stage.
2. Press key , the symbol is displayed.
   Press key -, the symbol is displayed.
3. Measure the percentage of CO_2 and compare it with the value in the table below.
   If the percentage of CO_2 differs from these values, set the percentage of CO_2 using the setting screw on the pressure regulator on the gas valve unit (see drawing above).
4. Remove the measuring appliance and close the measurement points.
5. Carry out a gas tightness check.

O_2/CO_2 checking and setting value (Open air box)					
Boiler type	Fan rotation speed (rpm)			CO_2 for Gas H Gas L and Gas Lw	CO_2 for Propane
	Low speed				
	Gas H/L	Gas Lw	Propane	%	%
C 230-85 ECO	1200	1200	(1)	9.3 ± 0.3	(1)
C 230-130 ECO	1300	1300	(1)	9.3 ± 0.3	(1)
C 230-170 ECO	1000	1000	(1)	9.3 ± 0.3	(1)
C 230-210 ECO	1200	-	(1)	9.3 ± 0.3	(1)

- Return the boiler to user level.
- Heat the installation to around 80°C and then stop the boiler.
- Bleed the heating installation. Check the water pressure.
- The boiler is now operational.
- Set the boiler control system. Indicate the type of gas used.
- Start the boiler.

The boiler comes with a certain number of basic settings:
Burner regulation - Modulating, depending on the outlet temperature
Maximum outlet temperature: 80 °C.

The various operating situations:

- Regulating function : The boiler output varies depending on the flow temperature requested by the modulating regulator.
- ON/OFF operation : The boiler output varies between the minimum and maximum values depending on the set flow temperature.

(1) For conversion to propane, refer to the instructions provided with the conversion kit.

5.4.5 Limiting input to 115 kW (Only 4 section boilers)

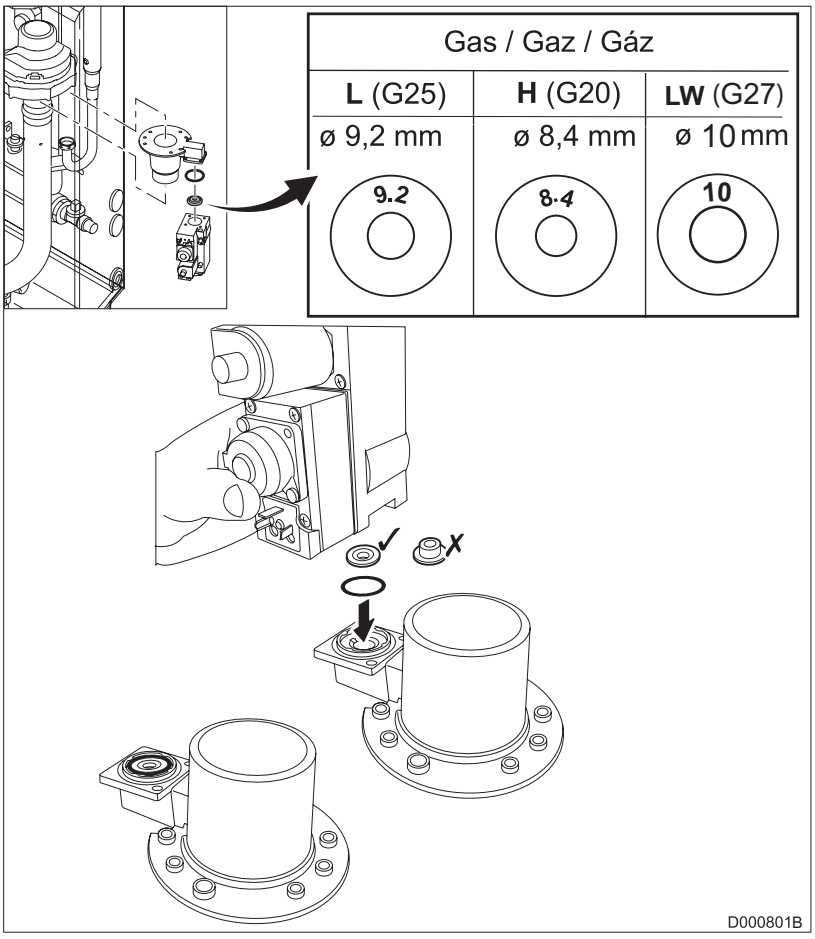
1. Press the key until **#CONFIGURATION** is displayed.
2. Press until **#LIMITED TEMP.** is displayed.
3. Press until **MAX.R.HEAT(%)** is displayed.
   Set to: 93%.
4. Press until **MAX.DHW(%)** is displayed.
   Set to: 93%.

5.5 Changing gas

To switch from natural gas H to natural gas L/Lw or propane carry out the following operations.

5.5.1 Switching from gas H to gas L/Lw and vice versa

If the % of CO_2 differs from versions C 230-85 ECO and C 230-130 ECO at high stage :
- Check the boiler on low stage
- Check the high stage
- Check the position and measurement of the restriction



5.5.2 Switching from Natural Gas to Propane

Refer to the instructions booklets provided in the conversion kits:
- GV 23: 3 to 4 sections
- GV 27: 5 to 6 sections

5.5.3 Setting the burner parameters

See chapter "Gas settings"

5.5.4 Adjustment of the CO_2 values

Refer to the settings tables provided with the conversion kits.

5.6 Changing the settings

Refer to the connection instructions supplied with the control panel..

6 Stopping the boiler

- Cut the power supply to the boiler.
- Close the gas valve.

Don't forget the risk of frost.

6.1 Precautions to take if there is a danger of frost

Heating circuit:
Use a correctly dosed antifreeze to prevent the heating water freezing. If this cannot be done, drain the system completely. In all cases, consult the fitter.

Domestic hot water circuit:
Drain the domestic water tank and pipes.

6.2 Precautions to take in the event of prolonged shutdown (one year or more)

- Close the gas valve
- The boiler and the chimney must be swept carefully.
- Close the door of the boiler to prevent the internal circulation of air.

7 Checking and maintenance

7.1 Checks

The boiler is almost maintenance-free if it is set correctly. The boiler only requires an annual check and cleaning if necessary.

The annual inspection of the C 230 ECO can be limited to the following operations:

- Checking the combustion in the boiler
- Setting the ignition electrode
- Checking tightness (hydraulics, combusted gas discharge and gas)
- Checking the hydraulic pressure

7.1.1 Checking the combustion in the boiler

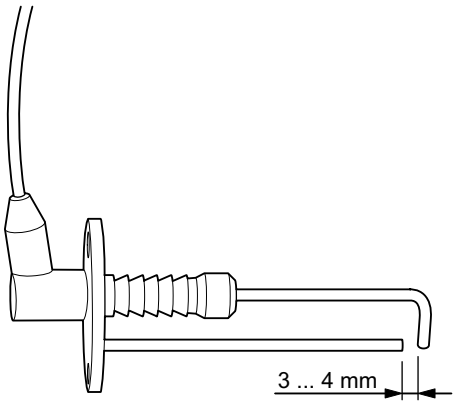
This check can be carried out by measuring the CO_2 / O_2 content in the combusted gas discharge duct at the measurement point and the gas pressure in the combined valve unit. To do this, heat the boiler to a water temperature of around 70°C.

The temperature of the combusted gases can then be measured at the measurement point in the combusted gas discharge duct. This temperature may not exceed the flow temperature by more than 30°C.

If the flow temperature is more than 30°C higher than the flow temperature setting, the heating body must be cleaned.

7.1.2 Setting the ignition electrode

Check the setting of the ignition electrode. The gap in the ignition electrode must be 3-4 mm. Otherwise, replace the electrode (and the gasket). Check the good general appearance (particularly that there are no shards, cracks, fouling on the porcelain) and the state of wear of the electrodes.



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7.1.3 Checking tightness (hydraulics, combusted gas discharge and gas)

Checking for leaks (water, combusted gas, gas).

7.1.4 Checking the hydraulic pressure

The hydraulic pressure must be a minimum of 0.8 bars. The hydraulic pressure depends on the static height higher than the boiler (static pressure, 1 bar = 10 metres C.E.). We recommend filling the installation to around 0.8 bars higher than the static height.

7.2 Maintenance

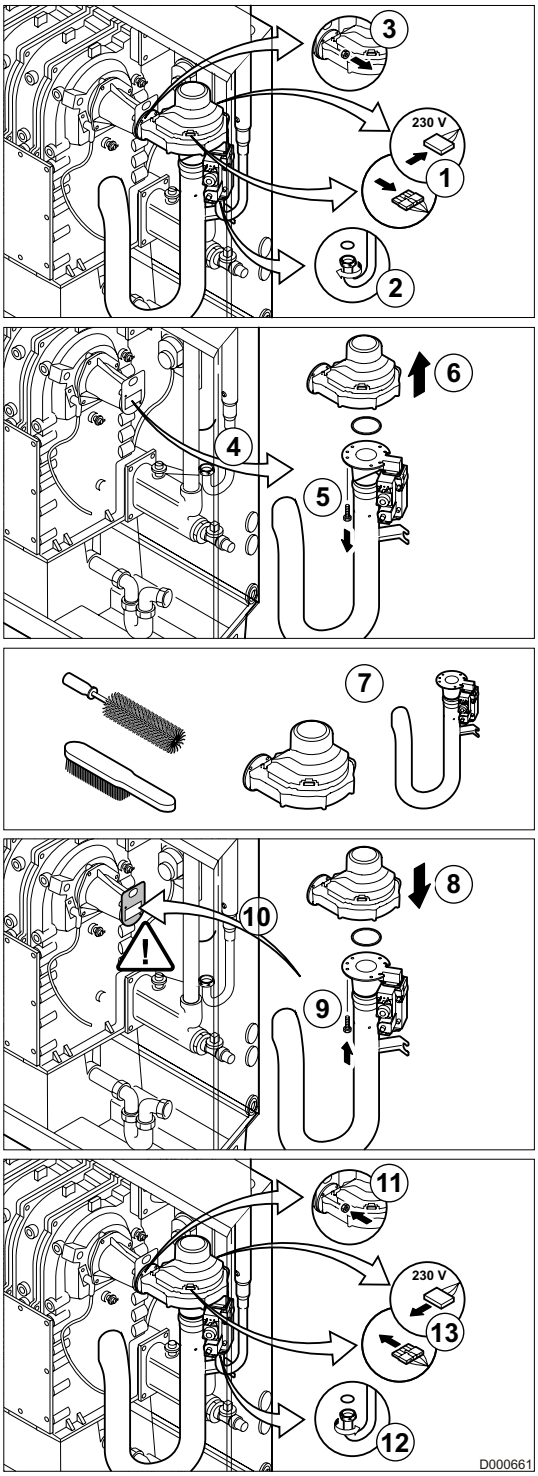
When the boiler is fouled, carry out the following maintenance operations.

- Clean the fan
- Clean the heat exchanger using the tool provided
- Clean the burner
- Clean the siphon

Before working on the appliance, ensure that the shut-off valve is closed and that the mains supply to the boiler is disconnected.

7.2.1 Clean the fan

■ C 230-85 and C 230-130



①	Remove the electrical connections from the fan
②	Unscrew the connecting nut under the multi-gas-valve unit (don't forget the gasket)
③	Unscrew the nuts and bolts on the outlet side of the fan

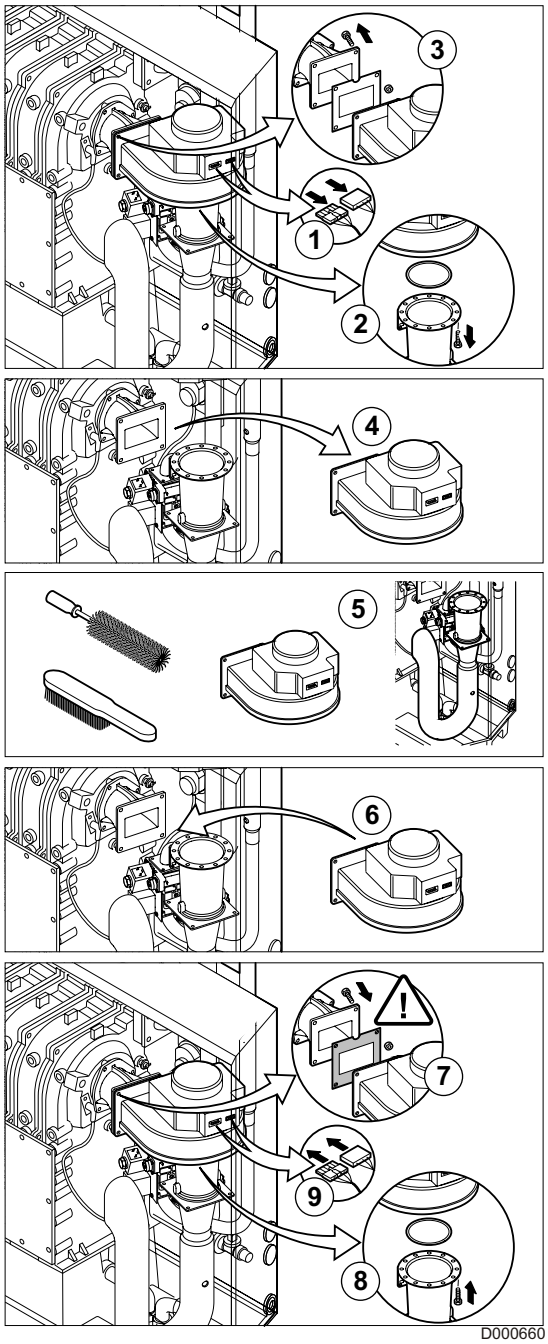
Disconnecting the gas valve mains supply cable.

④	Remove the fan, the venturi and the multi-gas-valve unit
⑤	Remove the bolts from the input side of the fan
⑥	Remove the venturi from the fan
⑦	Clean the fan with a plastic brush
	Remove dust from the fan before re-assembly
	Remove the silencer from the venturi
	Clean the venturi with a plastic brush
	Put the silencer in place
⑧	Fit the venturi to the fan
⑨ to ⑬	Replace the fan.

Connect the gas valve mains supply cable.

Ensure that the finishing plate between the fan and the venturi is correctly positioned.

■ C 230-170 and C 230-210



D000660

①	Remove the electrical connections from the fan
②	Remove the bolts securing the venturi to the fan
③	Unscrew the nuts and bolts on the outlet side of the fan

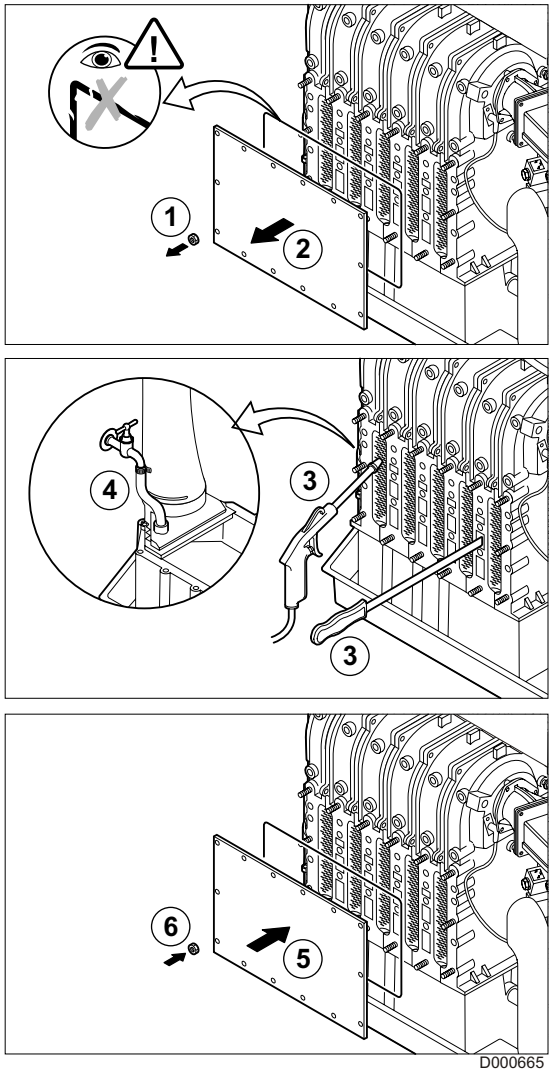
Disconnecting the gas valve mains supply cable.

①	Remove the electrical connections from the fan
②	Remove the bolts securing the venturi to the fan
③	Unscrew the nuts and bolts on the outlet side of the fan
④	Disconnecting the gas valve mains supply cable. Remove the fan, the venturi and the multi-gas-valve unit
⑤	Clean the fan with a plastic brush
	Remove dust from the fan before re-assembly
	Remove the silencer from the venturi
	Clean the venturi with a plastic brush
	Put the silencer in place
⑥ to ⑨	Replace the fan.

Connect the gas valve mains supply cable.

Ensure that the finishing plate between the fan and the venturi is correctly positioned.

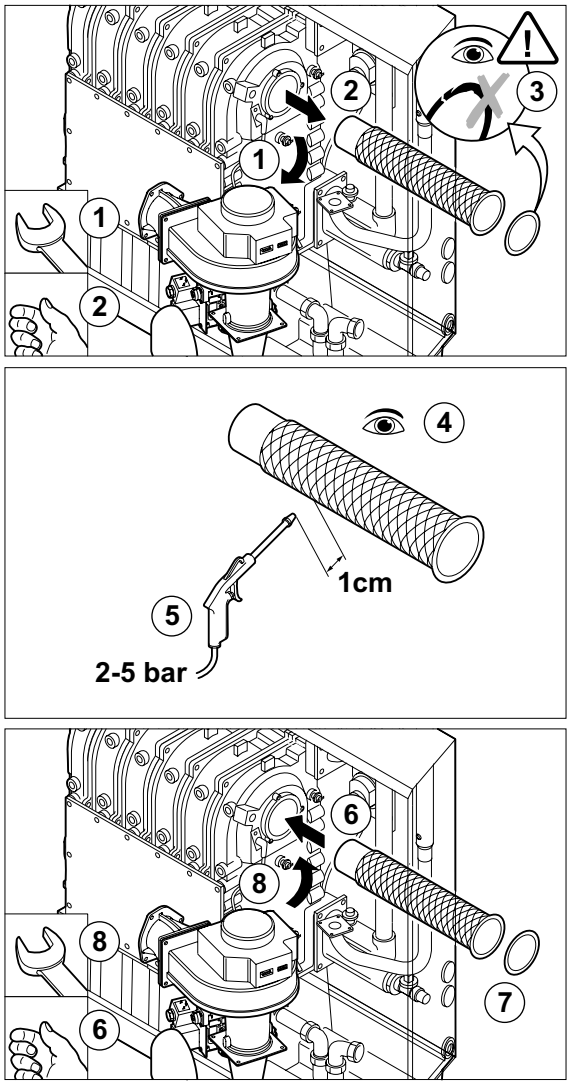
7.2.2 Clean the heat exchanger using the tool provided



The gasket between the inspection trap and the heat exchanger may stick, as may the one between the burner and the heat exchanger. Do not tear it

- Remove the nuts from the inspection hatch on the front of the heat exchanger.
- Remove the inspection trap from the heat exchanger.
- Clean the exchanger with the cleaning tool provided or, alternatively, with compressed air: rinse with water if necessary.
- The condensates collector can be cleaned by removing the plug from the top of the collector (before the flue gas discharge pipe) and rinsing the collector with water.

7.2.3 Clean the burner



D000666

- Remove the burner.
- Check the burner and, if necessary, vacuum clean without touching it (e.g. with compressed air between 2 and 5 bars: respect a distance of around 1 cm from the surface of the burner).
- Then replace all the parts in reverse order.

Avoid direct contact between the cables and the hot sections of the boiler

7.2.4 Clean the siphon

- Dismantle the siphon using the opposite of the assembly method. Clean the siphon.
- Fill the siphon with water.
- Re-assemble the siphon.

7.3 Troubleshooting

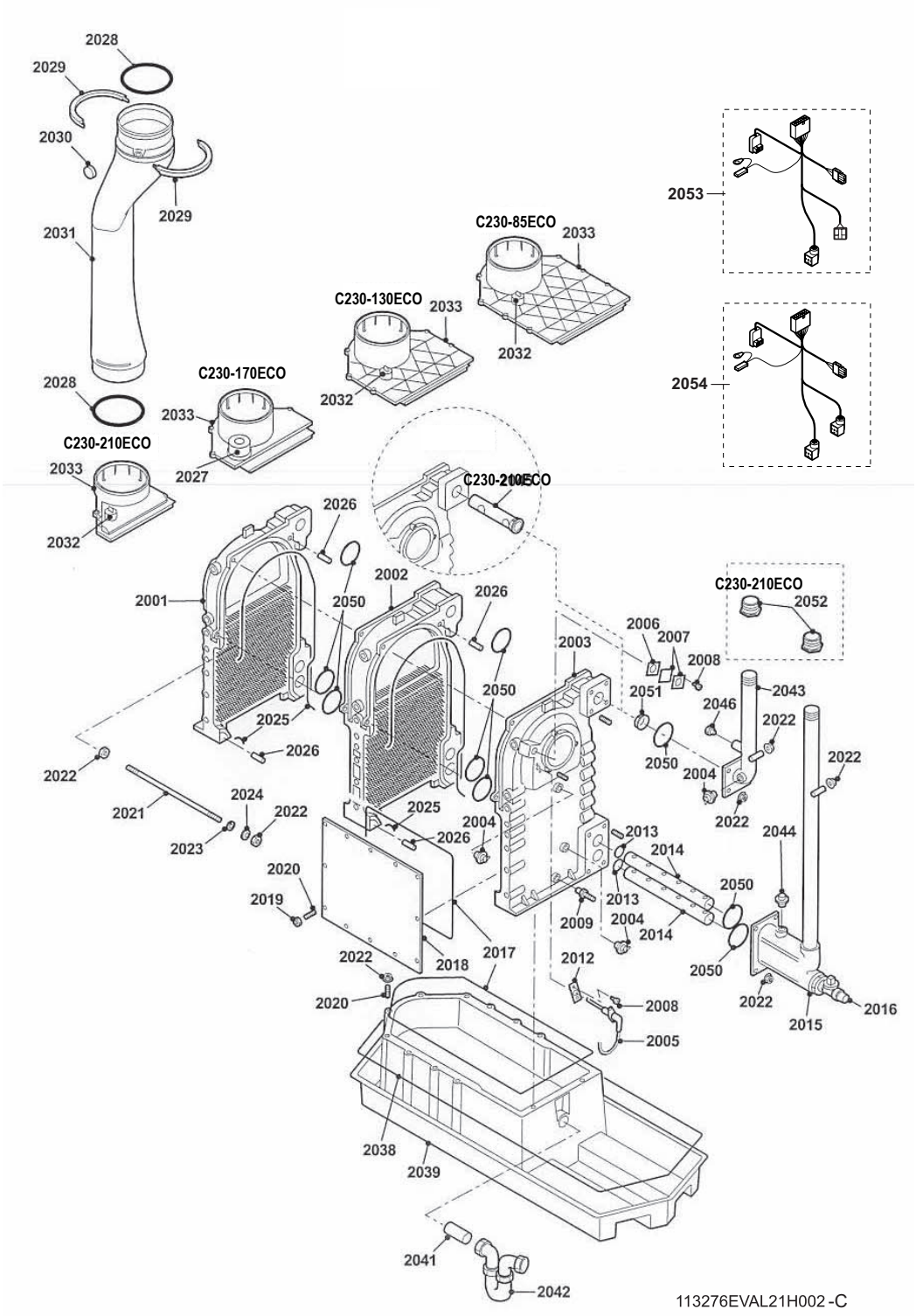
Refer to the connection instructions supplied with the control panel..

8 Spare parts - C 230 ECO

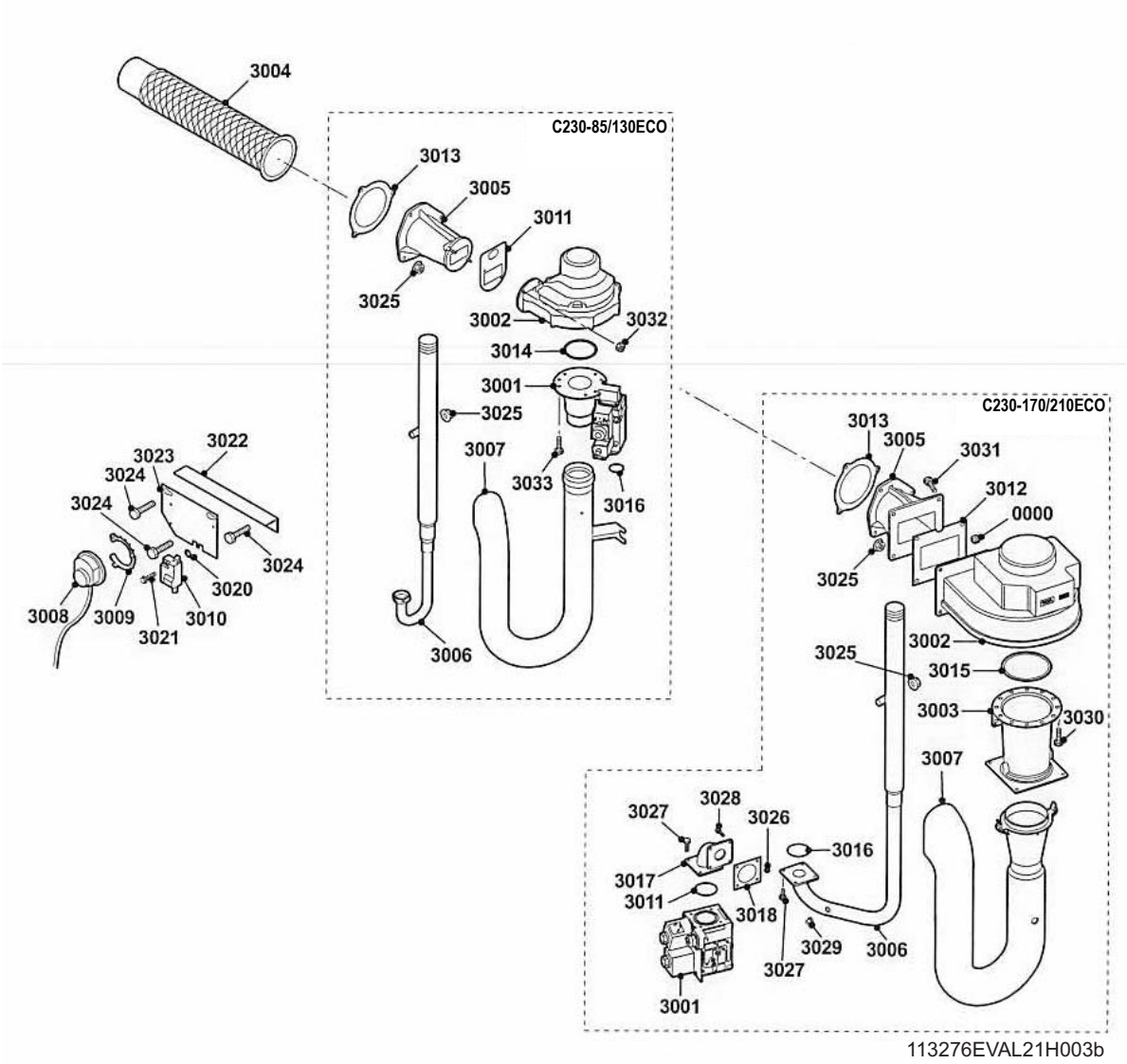
19/10/09- 300015171-002-B

To order a spare part, give the reference number shown on the list.

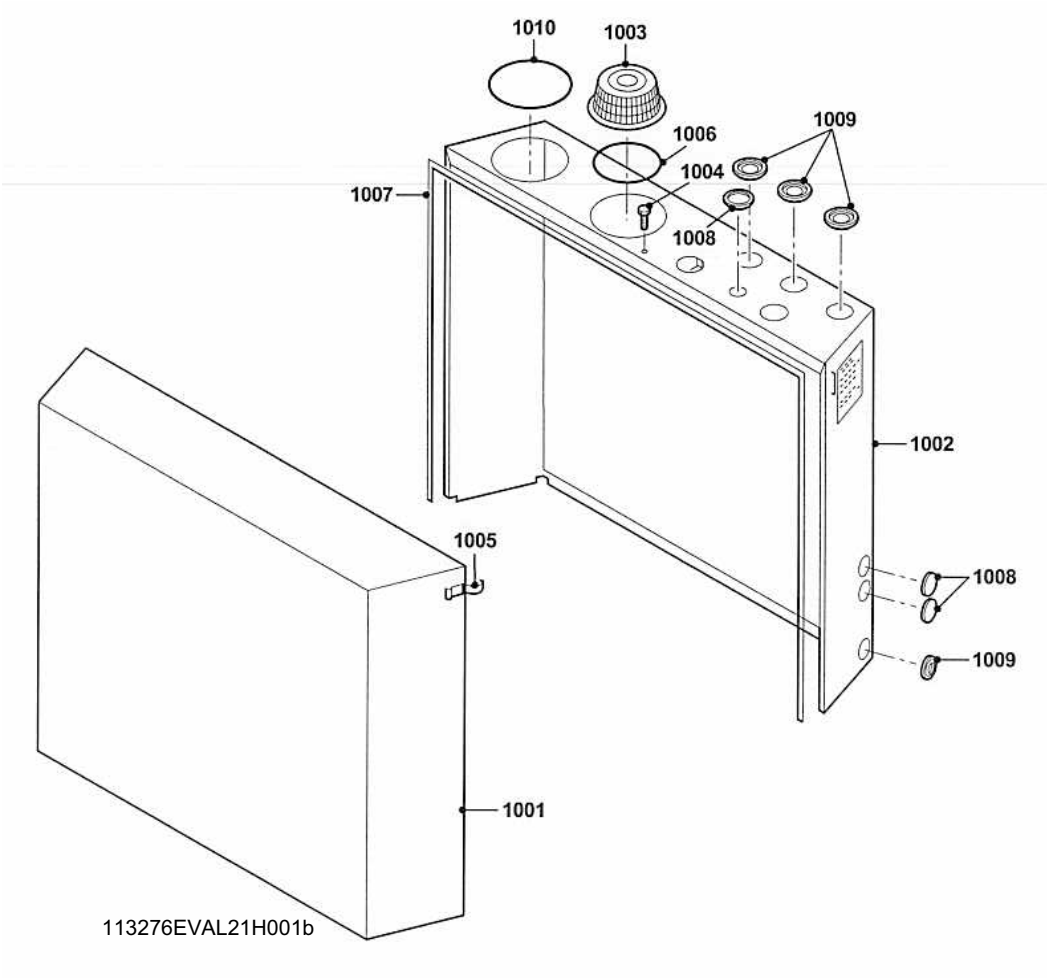
Boiler body



Gas circuit


3004
C230-85/130ECO
3013
3005
3011
3025
3002
3032
3014
3001
3025
3007
3033
3016
3006
3022
3023
3024
3024
3024
3020
3008
3009
3010
3021
C230-170/210ECO
3013
3005
3031
3012
0000
3025
3002
3025
3015
3003
3030
3007
3027
3028
3026
3016
3017
3011
3018
3029
3006
3027
3001
113276EVAL21H003b

Casing


1010
1003
1009
1006
1004
1007
1008
1002
1005
1008
1009
1001
113276EVAL21H001b

Ref.	Code no.	Description
		Boiler body
	S100633	Boiler body - Exchanger - 80 kW
	S100634	Boiler body - Exchanger - 120 kW
	S100635	Boiler body - Exchanger - 160 kW
	S100636	Boiler body - Exchanger - 200 kW
2001	S52481	Lateral section left
2002	S52482	Intermediate section
2003	S52480	Lateral section right
2004	S44698	Temperature sensor
2005	S100604	Ignition electrode
2006	S35458	Flame inspection window gasket
2007	S100554	Inspection flange
2008	S100535	Screw M4 x 8
2009	S100592	Condensates evacuation pipe
2012	S53489	Electrode gasket
2013	S100550	O-ring
2014	S100557	Water return distribution pipe - 3 sections
2014	S100558	Water return distribution pipe - 4 sections
2014	S100559	Water return distribution pipe - 5 sections
2014	S100560	Water return distribution pipe - 6 sections
2015	S100582	Flue gas connection part
2016	S55703	Valve 1/2"
2017	30629	7 mm Ø thermocord gasket
2018	S100545	Inspection hatch - 3 sections
2018	S100546	Inspection hatch - 4 sections
2018	S100547	Inspection hatch - 5 sections
2018	S100548	Inspection hatch - 6 sections
2019	S100556	M8 nut
2020	S100549	Stud M8
2021	S100561	Anchorage bars - 3 sections
2021	S100562	Anchorage bars - 4 sections
2021	S100563	Anchorage bars - 5 sections
2021	S100564	Anchorage bars - 6 sections
2022	S44483	M8 nut
2023	S100088	Washer - 8.4 mm
2024	S100538	Spring 20 x 8.2 x 1
2025	35208	Mastic
2026	S100543	Pin 8 x 20
2027	S62122	Leakproof plug
2028	S100603	Leak proofing ring
2029	S100600	Tightening collar - Discharge pipe
2030	S62288	Flue gas sensor cap
2031	S100593	Discharge pipe
2032	S100591	Leakproof plug

Ref.	Code no.	Description
2033	S100587	Condensates tank plate - 3 sections
2033	S100588	Condensates tank plate - 4 sections
2033	S100589	Condensates tank plate - 5 sections
2033	S100590	Condensates tank plate - 6 sections
2038	S100291	Neoprene gasket
2039	S100542	Condensate tank
2041	S100536	Polyvinyl chloride pipe
2042	S100552	Siphon
2043	S100586	Flow pipe
2044	S100532	Plug 3.8"
2045	S100567	Flow water distribution pipe
2046	S100533	Plug 1/2"
2050	S100544	O-ring
2051	S100566	Reduction part
2052	S100565	Reduction part
2053	S100626	cable form 230 V
2054	S100627	cable form 230 V
	S100637	Kit - Maintenance
		Gas circuit
3001	S100575	Gas valve - 5-6 sections
3001	S100617	Valve/venturi unit - 3-4 sections
3002	S100576	Fan RG148
3002	S100611	Fan EBM G1G170
3003	S100574	Venturi - Gas block
3004	S53553	Burner - 3 sections
3004	S53554	Burner - 4 sections
3004	S53555	Burner - 5 sections
3004	S57988	Burner - 6 sections
3005	S100580	Premixing pipe - 3-4 sections
3005	S100581	Premixing pipe - 5-6 sections
3006	S100579	Pipe - Gas supply
3006	S100616	Gas inlet pipe
3007	S100597	Air silencer - 3-4 sections
3007	S100598	Air silencer - 5-6 sections
3008	S100613	Differential air pressure switch
3009	S100618	Stop chip
3010	S100572	Ignition transformer
3011	S56151	Gasket Fan - Exchanger
3012	S100632	Gasket
3013	S100551	Burner joint
3014	S100058	O-ring Fan-Venturi
3015	S100305	110 - 72 x 3.53 O-ring
3016	S100056	Gasket 27 x 20 x 2.5
3017	S100585	Elbow - Gas circuit
3018	S1000624	Venturi seal

Ref.	Code no.	Description
3019	S100619	O-ring
3020	S21473	Spacer - Ignition electrode
3021	S14254	Screw 4.2 x 9.5
3022	S100602	Corner profile
3023	S100601	Transformer support plate - Gas pressure switch
3024	S100541	Stud M8 x 60
3025	S44483	Nut M8
3026	S46687	Nut M5
3027	S100537	Stud M5 x 12
3028	S100570	Stud M5 x 20
3029	1035	Pressure socket Gas 1/8"
3030	S15524	Bolt M8 x 16
3031	S100531	Bolt M8 x 30
3032	S100055	M5 nut
3033	S100054	Screw M5 x 16
3034	S59818	M8 nut
	58286	Cleaning knife
	200012133	Accessories bag
	S100601	Transformer support plate - Gas pressure switch
	S100613	Differential air pressure switch
	S 44698	Sensor NTC
	S100572	Ignition transformer
		Casing
1001	200012132	Front panel
1002	S100610	Rear panel
1003	S100599	Air inlet basket
1004	S100534	Screw
1005	55683	Closing hook with opening device
1006	S100553	O-ring
1007	S100291	Neoprene gasket
1008	S100539	Grommet Ø 60 mm
1009	S100614	Set of grommets (red, blue and yellow)
1010	S100603	Leak proofing ring Ø 160

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19/10/09

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